FACTORS INFLUENCING STUDENTSô PERFORMANCE IN MATHEMATICS IN KENYA CERTIFICATE OF SECONDARY EDUCATION (KCSE); A CASE OF KATHONZWENI DISTRICT IN MAKUENI COUNTY, KENYA

BY

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DECLARATION

This is my original work and it has not been presented for award of Diploma or Degree in this or any other University.

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DEDICATION

This research project is dedicated to the following people; My beloved bishop ï martin Kivuva Musonde, my parents ï John Sila Makau and Victoria Nyiva Sila, my brothers and sisters and friends who always encouraged me to work hard in education.

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May God bless them all

ABSTRACT

The purpose of this study was to investigate the factors influencing studentsô performance in mathematics in the (KCSE); A Case of Kathonzweni district. The study focused on form two, form three and form four students, their mathematics teachers and principals who were randomly selected from the five secondary schools under study. Two hundred studentsô and ten mathematics teachers were randomly selected in order to participate in the study whereby the researcher was using 40 students from each school.

On professional qualification none of the mathematics teachers had doctorate in philosophy (Ph.D). One mathematics teacher was a holder of master of education (M.Ed) degree. This was 10% of the ten mathematics teachers. Four mathematics teachers were holders of bachelor of education (B.Ed) degree which is 40% percent of the total number of teachers under study. Two teachers were holders of post graduate diploma in education (P.G.D.E) and this was 20%. Two teachers were holders of Diploma in (Dip.) Education which was 20% of the teachers interviewed. Lastly there was one teacher who was a holder of S1 certificate which was 10% of the ten teachersô respondents.

About 50% percentage of mathematics teachers indicated that they had teaching experience ranging from two to six years in teaching profession. Rarely 80% percent of the respondents indicated that they had worked for over six years in the teaching area.

On the gender of mathematics teachers the ratio of female to male mathematics teachers, was revealed that only one female teacher to six male teachers (1: 6) were in the field of study.
Out of hundred and sixty one students who responded to the questionnaire, hundred were male and sixty one were female. On age in years 30% of respondents were of age between sixteen to eighteen years while one hundred and twenty two respondents which was 70% were of the age between nineteen and forty five years.

On the major problem that the students encountered on learning mathematics, it was revealed that some of the objectives in mathematics were unrealistic and not easily achievable within the given time and resources. It was also shown that there were many (seven subjects) taught and as a result the students did not master the expected basic views.

Further on the major problem encountered by the students, it was shown that the students found it difficult to relate different concepts in the topic of mathematics. The respondents noted areas such as trigonometry, vectors, commercial arithmetic etc of which they found them difficult to work on. They find it hard to use logarithm tables and calculators in solving problems related to the topic such a cosines, sines and tangent. It was desired that where there were overloads, overlaps or complicated topics, it was necessary to address and remove some contents.

It was concluded that the schools under study performed poorly in mathematics in the Kenya Certificate of Secondary Education (KCSE) due to studentsô attitude towards mathematics as students believe that mathematics is the hardest subject. It was also concluded that there were inadequate number of teachers particularly in mathematics, resulting into a situation where

students are not adequately prepared for national examinations. It was also concluded that the male teachers dominate i.e. they were the majority hence leading female students to perform poorly as female teachers were less than male teachers.

It was recommended that there has to be a balance of male and female mathematics teachers. This would enable consistency of performance of female students as they would be motivated by their female teachers. It was recommended that some difficult topics in mathematics be restructured into simple and manageable topics especially in vectors, commercial arithmetic and trigonometry, algebra etc. It was therefore recommended that those topics which are difficult should be repeated in other levels in a simpler way. It was also recommended that teacher should be innovative and creative in teaching mathematics.

It was suggested that this study should be carried out in a wider coverage to include other schools outside Kathonzweni district. Further research was suggested on the topics which were overlapping or overloaded and are difficult to manage by students. Further research should be carried on the effectiveness of the provision of remedial classes. It was suggested that a study be carried out on the effect of emerging issues such as industrial transformations, health education issues like drug abuse and HIV/AIDS perdemics, children rights, moral values and social responsibility in relation to academic performance.

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LIST OF ABBREVIATIONS AND ACRONYMS

ASEI ï Activity Student- centered, Experimentation and Improvisation

ATS- Approved Teacher Status

B.Ed ï Bachalor of Education

D.C- District Commissioner

D.E.O ï District Education Officer

K.I.C.D ï Kenya Institute of Curriculum Development

K.I.E- Kenya Institute of Education

K.C.S.E ï Kenya Certificate of Secondary Education

KIE ï Kenya Institute of Education

KNEC ï Kenya National Examination Council

M.Ed ï Master in Education

MOEST ï Ministry of Education Science & Technology

MOEST ï Ministry of Education, Science and Technology

P.G.D.E- Post Graduate Diploma in Education

PDSI ï Plan, Do, See and Improve

Ph.D- Doctor of Philosophy

SMASSE ï Strengthening of Mathematics and Sciences in Secondary Education

T.S.C- Teachers Service Commission

U.T ï Untrained Teachers

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

Education in Kenya has over the years been acknowledged as an important element in the countryôs development process. The government recognizes the necessity of education through the various educational commissions set up to map out the way forward on matters of education. The Kenya Educational Commission Report (Republic of Kenya 1964) acknowledged that the countryôs socio- economic progress largely depends on the general rising of the standards of education among the masses of population.

Africa and the rest of the world started programmes of education with the aim of eradicating the problem of inability to read and write. Campaigns gained impetus after research figures on population, growth, wealth and death rates showed that poverty, disease and literacy go hand in hand (Townsend 1977). Education provides opportunities to the youth aged below twenty five years to have their chances in the formal education system during their childhood.

Education is widely accepted as a most important form of human resource development both in developed and developing countries. It is considered as a means of accelerating economic development through increased labour productivity. It was perceived by African countries which emerged from independence, as a vehicle through which rapid social and economic development could be achieved (Eshiwani 1993).

The meaning of education therefore is the development of skills, knowledge, ability and character by teaching, training, study or experience. The national report on the development of Education in Kenya (2001) puts clear that the Ministry of Education, Science and Technology (MOEST) is responsible for all educational matters in Kenya and is structured into departments such as Basic education, Higher education, Quality assurance and standards, Technical Education and Educational Planning and policy. In 1985 education system of Kenya was changed from the 7:4:2:3 system to the current 8:4:4 system, which represents eight years of primary education, four years of secondary education, four years of basic university education as opposed to the previous system of seven years of primary education, four years of secondary

education, two years of forms five and six (advanced level) and three years of basic university education.

According to the 1998 Ministry of Education, Science and Technology (MOEST) master plan, secondary education is very crucial since students are prepared to sit for the Kenya Certificate of Secondary Education (KCSE) examination. The Kenya National Examination Council (KNEC) administers Kenya Certificate of Secondary Education (KCSE) Examination under the guidance, direction and supervision of teachers.

Amongst the many returns for heavy investment in secondary education is good performance in examination by students in Kenya Certificate of Secondary Education (KCSE) Examination which is a necessity for selection and placement of studentsô in institutions of higher learning and jobs in various firms (Kimani 1991). It is also crucial for admission into competitive courses in public universities. Most courses require specific course clusters in all the subjects especially in mathematics and the sciences. Poor performance in Kenya Certificate of Secondary Education (KCSE) examination therefore reduces the studentsô chances of joining institutions of higher learning and consequently jeopardizing their opportunities for job placement. This reduces their active participation in national development.

In Kenya's secondary school education system, mathematics is one of the compulsory subjects. While justifying this, Kenya National Examination Council (KNEC) secretary Wasanga(2009) stated that the learning of mathematics is important because of the skills and knowledge acquired which are useful in everyday situation as well as in learning of other subjects in the curriculum and its application in industry and commerce after school. This great emphasis on mathematics in school curriculum has motivated the need for this research.

A good grade in mathematics is also critical when it comes to selection of the course to pursue after the KCSE or in higher education levels. It is a prerequisite for most degree programmes and selection for further training in Kenya.

While the importance of mathematics cannot be over emphasized, many educators, parents and practitioners in Kenya have decried the poor achievement levels in the subject at both primary and secondary levels (Oluoch 2000). The proposed study investigated the performance of mathematics at secondary school level in Kathonzweni district.

The perennial dismal performance in mathematics in the KCSE examinations has raised a lot of concern nationwide taking into consideration the role mathematics plays in technological, economic and industrial development. Education Permanent Secretary Professor George Godia (2010 Kenya) said an audit conducted after perennial performance in mathematics and science subjects revealed that most teachers of these subjects are incompetent. The audit revealed that those teaching sciences including mathematics at elementary level got as low as D grade in the subject.

The table below shows mathematics performance

Table 1: National KCSE mathematics results (2006 - 2010)

Year	Enrolment	Paper	Mean (x/100)
2006	139,000	1 2	13.5 11.0
2007	143,703	1 2	17.5 15.1
2008	145,602	1 2	18.1 18.6
2009	148,521	1 2	20.0 19.5
2010	149,250	1 2	17.2 21.5

Source: Adopted from KNEC 2010, 2008 and 2007 KCSE examination results.

Poor performance in mathematics has been a persistent problem as shown in table 1. These figures are certainly an indicator that mathematics performance in the KCSE is inadequate. In 2005, the director of education observed that poor performance in mathematics in national examinations was worrying and not doing well for the future of this country (Mwangi 1986).

Students performance in mathematics in Kathonzweni district has been miserable going from bad to worse in the recent years: 2006 to 2010(Kathonzweni district education office), available statistics showed that less than 15% or 500 out of the average 3,300 in the year 2006 form four candidates got B+ and above in mathematics in Kathonzweni district. On average about 85% of candidates got between D+ and E in Kathonzweni district.

In 2009 for example the overall performance of mathematics in Kathonzweni district was an average of 24.5% among boys and 24.4% among girls. The results showed average score was paltry 12%. It showed that after four years of high school education one was likely to get one question right out of ten meaning that 90% of what was taught was not understood (Daily Nation September 26th 2010). This raised much concern among educationist, parents, students, teachers and the entire country as a whole. Empirical studies of the factors influencing performance of mathematics in the Kenya Certificate of Secondary Education (KCSE) Examination were too demanding (Dutton and Blum1967). The study sought to assess the factors that influence academic performance of mathematics in the Kenya Certificate of Secondary Education (KCSE) examination in Kathonzweni district, Makueni County. This was the research gap; this present study intended to fill.

The table below indicates that performance of mathematics in secondary schools of Kathonzweni district is poor.

Table 2: performance indices and grades in KCSE for public secondary schools in Kathonzweni district (2006-2011)

Year	Performance index	Grade
2006	1.3	E
2007	1.4	E
2008	1.5	E
2009	1.6	D-
2010	1.6	D-

Source: Makueni county education office.

1.2 Statement of the problem

Given the importance of mathematics in occupational success, especially in Kenya that opts to be industrialized by the year 2030, the background information reveals that situation as wanting in Kathonzweni district of Makueni County. This is due to the fact that the performance of secondary school students in Kenya Certificate of secondary education (KCSE) is very low compared to other areas. This study aims to find out factors that may be influencing the situation.

Specifically the independent variables that are investigated are studentsô attitude towards mathematics in their performance, professional qualification of mathematics teachers in studentsô performance, mathematics teachers teaching experience in studentsô performance, secondary school mathematics teachersô gender in studentsô performance, and studentsô career aspirations in studentsôperformance while the dependant variables are the outcome in mathematics studentsô performance in KCSE.

1.3 Objectives of the study

The main objective of the study is to investigate the factors that influence studentsô academic performance in mathematics in the (KCSE) examination in Kathonzweni district. The study will be guided by the following specific objectives.

1. To establish how studentsô attitude towards mathematics influences studentsô performance in the (KCSE) examination in Kathonzweni district.
2. To investigate how professional qualification of mathematics teachers influences students performance in mathematics in the KCSE examination in Kathonzweni district.
3. To investigate how teaching experience of mathematics teachers influences studentsô performance in mathematics in the KCSE examination in Kathonzweni district.
4. To establish how gender disparity among mathematics teachers influences studentsô performance in mathematics in the KCSE examination in Kathonzweni district.
5. To investigate how studentsô career aspirations influences studentsô performance in mathematics in the KCSE examination in Kathonzweni district.

1.4 Research questions

The study will be guided by the following research questions:

1. How does studentsô attitude towards mathematics contribute to their performance in mathematics in the Kenya Certificate of Secondary Education (KCSE) examination in Kathonzweni district?
2. How does the professional qualification of mathematics teachers influence studentsô performance in mathematics in the KCSE examination in Kathonzweni district?
3. To what extent does the teaching experience of mathematics teachers influence studentsô performance in mathematics in the KCSE examination in Kathonzweni district?
4. Does gender disparity of secondary school mathematics teachers influence studentsô performance in mathematics in the KCSE examination in Kathonzweni district?
5. Does studentsô career aspiration influence performance of students in mathematics in the KCSE examination in Kathonzweni district?

1.5 Purpose of the study

The purpose of the study is to establish the factors that influence studentsô performance in mathematics in the KCSE Examination in Kathonzweni district, Makueni County and solutions for the improvement of studentsôperformance in this subject.

1.6 Significance of the study

The study findings will contribute to the existing body of knowledge in the area of mathematics in Kathonzweni district.

1. The research findings will help to create awareness among students concerning opportunities to improve mathematics in the KCSE examination.
2. The study findings will also be useful in guiding policy formulation in the area of education in Kathonzweni district.
3. The study will be of benefit to educationist as it will open more research gaps for future research in the field of education, particularly in dealing with factors influencing students performance in mathematics in the KCSE examination in Kathonzweni district.

4. To the school management committee, it will create awareness on the cause and therefore seek remedies in the improvement of mathematics in the KCSE Examination in Kathonzweni district.
5. The views from various mathematics teachers will enrich teaching approaches, identify and give a probable and workable solution to some of the problems facing them in teaching mathematics.

1.7 Limitations of the study

The study limits itself to only one district in the entire country. For a more conclusive report, all educational institutions should be studied. However, this is not possible due to lack of sufficient finance and time factors. The study will not handle the views of all stake holders in education sector since this would need considerable time and resources. The study will also be limited to principals, mathematics teachers and students in Forms 2, 3 and 4 in the district because of their accessibility. Further on the limitation of the study, students whose performance in the Kenya Certificate of Secondary Education between 2006 ï 2010 inspired this investigation are inaccessible for the study, as they were out of school and could not therefore be used for the research study.

1.8 Delimitation of the study

The researcher uses schools that have been in existence for five or more years, the number being five secondary schools. The assumption being that very new schools may have teaching problems. The study will be carried out in Kathonzweni District of Makueni County. It will include five secondary school principals, students and mathematics teachers of the five secondary schools which have been in existence for five or more years and thus, findings may not be generalized to other schools outside the district. It will not be logically possible to study all the factors related to performance in mathematics in this study. Therefore, other equally important factors that may affect performance e.g. Intelligence, self concept. The research focuses on a particular category of factors influencing studentsô performance in mathematics.

1.9 Basic assumptions of the study

1. The respondents will be expected to provide honest, truthful and accurate responses to the questions asked.

1.10 Operational definition of significant terms

1. **Performance of mathematics:** Refers to studentsô mathematics achievement scores as measured by the achievement of tests obtained in examinations.

2. **Academic performance:** in this study academic performance is defined as the achievement in an examination as indicated in the following;

a) **Excellent** ranges from 80% to 100% i. e grade A- to grade A plain.

b) **Very good** ranges from 70% to 79% i. e grade B- to B plain.

c) **Good ranges** from 60% to 69% i. e grade C Plain to C+

d) **Fairy good** ranges from 50% to 59% i. e grade D+ to C-

e) **Poor ranges** from 0% to 49% i. e grade E to D plain.

3. **Examination:** is defined as the study or use of numbers and shapes to calculate, respect or describe things. This includes arithmetic which is the formal system of questioning or a set of questions or exercises, evaluating skill or knowledge.

In other words it is the act of giving students or candidates a test to determine what they know or learn. It is also said to be a detailed inspection of somebodyôs conscience as done daily by religious.

4. **Attitudes:** Refers to as a state of readiness or tendency to and in a certain manner when confronted with specific stimuli. It means emotional feelings towards the study of mathematics. Attitudes towards mathematics may be positive or negative.

(i) **Negative attitude** ï refers to unfavourable feelings towards something for example a student disliking mathematics subject.

(ii) **Positive attitude** ï refers to favourable feelings towards something for examples a student liking mathematics

5. **Professional qualification:** Refers to any training that the teacher has received in relation to teaching.

6. **Candidates:** refers to a student who has registered with KNEC and is preparing for KCSE.

7. **Secondary school:** refers to all classes from form 1 to form 4 in Kenya system of education that is institutions attended after primary school level in Kenya.

8. **Resource:** refers to finance, material and people necessary for pursuit of educational goals and objectives.

9. **Teaching:** Refers to planned activities through which desirable learning takes place.

10 .Performance index: Refers to students academic achievement in the Kenya Certificate of Secondary Education (KCSE) grades on a 12 point scale from the highest being A Plain with 12 points to the lowest E with 1 point.

11. **Kenya National Examination Council (KNEC):** This refers to a kenyan body which is responsible for the setting, administration, business course exam and technical examinations.

12. **Kenya Certificate of Secondary Education (KCSE):** This refers to a examination taken by candidates at the completion of the four year secondary school course under the 8:4:4 system of education.

13. **Academic qualification:** Refers to as the education level achieved.

14. **Mathematics teachers:** refers to both male and female instructors teaching mathematics in Kenya.

15. **Analysis:** Refers to critical examination, evaluation and passing of judgement.

16. **Gender:** refers to either male or female sex. As in our study it refers to both sexes of candidates.

1.11 Organization of the study

The proposed study will be organized into five chapters. These are as follows:

Chapter one lays the basis of the study and comprises of the background of the study, statement of the problem, objectives of the study, research questions, purpose and significance of the study, limitation of the study, delimitations of the study, assumptions of the study, definition of significant terms and organization of the study.

Chapter two comprises of literature review of related factors influencing studentsô performance in mathematics in the Kenya Certificate of Secondary Education (KCSE) examination, which includes the following sub-topics: Studentsô attitudes towards mathematics in their performance , professional qualification of mathematics teachers in students performance, mathematics teachers teaching experience on studentsô performance in mathematics, gender disparity of mathematics teachers in studentsô performance in the KCSE examination and studentsô career aspirations of studentsô performance in mathematics.

Chapter three, which is the research methodology section, contains introduction, research design, target population, locale, sample size and sampling procedure, research instruments

which includes questionnaires, instrument validity, instrument reliability, data collection procedure and data analysis techniques. Chapter four will discuss the research findings and interpretations. Finally chapter five will discuss the summary of findings, conclusions and the recommendations of the study.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction:

The review focuses on mathematics as a concept where its definition is given on the importance of mathematics and why the subject is taught. The purpose of this chapter is to review relevant literature on factors influencing studentsô performance in mathematics in the Kenya Certificate of Secondary Education (KCSE). The review focuses on the following areas of studentsô attitudes towards mathematics in their performance, professional qualification of mathematics teachers in studentsô performance, mathematics teachers teaching experience in studentsô performance, mathematics teachersô gender disparity in studentsô performance in mathematics and studentsô career aspirations in their performance in mathematics. Then finally a conceptual framework of the study is also provided.

2.1**Definition of mathematics**

Mathematics as a concept has many definitions. Johnson and Rising (1972) have defined mathematics as a creation of the human mind concerning primarily ideas, process and reasoning. It is a way of thinking, a way of organizing logical proof. Mathematics (Cockcroft) report of (1982) sees mathematics as a way of communication language that uses carefully defined terms and concise symbolic representations as seen in use of graphs, tables and charts. Orton (1957) observes that mathematics is a product and process, both organized body of knowledge and creative activity in which the learner participates. Mathematics is also seen as an art where beauty, which consists of order and harmony, is seen, pleasure, enjoyment and intellectual stimulation is experienced through studying mathematics.

2.2 Students' Mathematics performance in the Kenya certificate of secondary education (KCSE)

The education ministry is working on changes that will ensure only those professionally qualified to teach mathematics and sciences are allowed to nurture students in the discipline (Godia, daily nation July 7th 2012). He further argued that to improve in these subjects, teachers would have to be assessed and allowed to teach only subjects that they can competitively handle. Students will also be coached on the mastery of subjects and allowed to pursue careers that fall in their preferred cluster of sciences.

Also set to face fresh audit of their competence includes District Quality Assurance Officers, most of whom he noted were competent in humanities, yet they were employed to ensure quality learning in sciences.

He further said that it is akin to a literary critic being asked to check whether sciences are being taught properly, citing the loopholes as one of the reasons behind poor performance in sciences particularly mathematics (Godia , daily nation July 7th 2012). Education minister Mutula Kilonzo (Kenya) (2012 July 7th, Daily Nation) stressed the need to improve teaching in sciences saying, they are key to the achievement of vision 2030. ñThe sciences are important in life and that is why we are serious about better students performance in themò (Mutula, Daily nation July 7th 2012 p. 3).

2.3 Mathematics teachers' role in students' performance in mathematics

Teachers are a core of any teaching and learning activity. Congolesi (1997) asserts that a satisfying teaching experience will largely depend on how well a teacher applies proven classroom management strategies. The national committee on education objectives and policies (1997) too stated that ñthe qualitative attributes of the teacher are of paramount importance in determining the quality of education on which the intellectual development of the child is based.ò

Mason (2003) while referring to mathematics performance observed that teachers were taking a critical approach in their teaching and were thus unable to achieve high outcomes. He further added that teachers are failing to be what they should be, that is being technical managers of instructions, material and activity. He also went further to say that as teachers; we should be at the fore front in being technical managers of instructions, material and activity as we should not avoid this as it is part of our teaching profession.

Teachers play an important role in studentsô performance in mathematics. For instance in a study by Waihenya (2000), a student blames the teacher for poor performance in mathematics and sciences. Waihenya says that the teachers concentrate on the few students they have identified as liking the subject at the expense of the weak ones who are put off by this behaviour.

As a result such teachers fail to emphasize mathematics skills where necessary tools for solving problems and daily life challenges.

In 2007 KCSE mathematics report shows that the problem of poor mathematics performance lies with the instructor, training process, ability to adapt to changes in curriculum and lack of opportunity for skill improvement. Shiundu (1982) noted that teachers without proper academic and professional qualifications fail to do justice to the students. He further adds that an adequate qualification of the teacher instills self confidence in the teacher and serves as an inspiration to pupils.

2.4 Implications of students' performance in mathematics

Students with poor grades in mathematics may not join institutions of higher learning in which good mathematics grades are an admission requirement. Public secondary schools in Kathonzweni district have been performing poorly over the years as shown in table 2.

This can be viewed better by observing at the mathematics mean indices for the schools in KCSE exams marked out of 100.

Table 3: KCSE mean indices for secondary schools in Kathonzweni district.

Year	Mean index (x/100)
2006	4.9
2007	5.3
2008	6.7
2009	6.8
2010	7.6

Source: (Makueni County Education Office)

The mean marks for public secondary schools in Kathonzweni district for the last five years have been poor as shown in table 3. Despite upward trend of improvement for five years; the marks are still low with means being less than 10% for all the five years. The studentsô poor performance in mathematics s in public secondary schools of Kathonzweni district clearly comes out by considering the number of grades E's registered in these schools.

Table 4: Grade E percentage contribution by public secondary schools in Kathonzweni district.

Year	Total number of Grade E's in Kathonzweni district	Number of Grade E's from secondary schools	% representation
2006	826	681	88.5
2007	848	719	84.8
2008	798	708	88.7
2009	726	635	87.5
2010	724	653	90.2

Source: Makueni County Education Office

According table 4, it is evident that secondary schools of Kathonzweni district have been contributing over 80% of all the E's in the district with previous years hitting over 90%. This indicates that studentsô performance in mathematics in public secondary schools in Kathonzweni district is poor. Mathematics performance of these schools is wanting. Students with poor grades may not join institutions of higher learning where good grades in mathematics are required and cannot enroll for the prestigious courses that require a good grade in mathematics as a mandatory requirement. The proposed study will seek to investigate the issues surrounding studentsô poor performance in mathematics in secondary schools of Kathonzweni district.

2.5 **Importance of mathematics**

Mathematics has been considered an important subject in that it is vital component in almost all life situations. The importance of mathematics is strongly expressed by Cokroft (1982) who observed that there can be no doubt that there is general agreement that every child should study mathematics in school. Not only has very great progress been made in mathematics over the past few years, but its fields of application have also grown considerably. Nowadays it is becoming imperative that all children be taught mathematics, not simply as an empty piece of learning, but as a tool which they may need later in their work.

The importance of mathematics in communication as well cannot be underscored as Irumbi (1990) noted; mathematics plays a key role in communication of information and ideas by use of figures, letters, tables, charts, graphs, diagrams and even geometric constructions, it is also quite useful for the development of logical thinking, accuracy and spiritual awareness.

These are essential ingredients in mental development of man and there is need to promote development. Mathematics is therefore a necessity in day to day living as deduced by what mathematics should help one do as mentioned above.

A number of studies have been carried out by researchers to identify and analyze factors influencing student performance in mathematics and in national examinations in general particularly Kenya Certificate of Secondary Education (KCSE) examination. One such study is an internal one of failure in mathematics where Husôen (1967) considered the relationship between achievement in mathematics and school teachers plus pupilsô characteristics and social factors. Other notable studies on factors affecting performance of mathematics include those by Begle (1973) and Callaghan (1971). In Kenya, a number of studies have been conducted in the same area. Kibanza (1980) in his study on some factors associated with performance in mathematics among form two pupils in Kenya considered such factors as pupils sex, attitude towards mathematics future aspiratory as well as their social-economic backgrounds. Mwangi (1986) studied factors influencing the performance in and learning of mathematics among secondary school students' in Kenya. Kiragu (1996) studied factors that influence performance in mathematics evaluation examination by standard seven pupils in Township educational zone of Gachoka District of Embu County. In his study, he compared the performance of rural and urban primary schools in Gachoka district.

From all these research studies the factors related to pupils, school and social backgrounds, socio-economic factors have formed the basis of the studies of factors that lead to poor performance in mathematics. However, the findings from these studies and others conducted elsewhere in the world seemed to be at variance. The researcher thus intended to conduct a study into some factors that affect achievement in mathematics specifically in the KCSE.

2.6 Impacts of students' attitudes towards mathematics in students' performance

Many educators agree that attitudes play an important role in teaching and learning of mathematics. Attitudes refer to how one thinks, feels about and acts towards objects and ideas Keil (1985). He defines attitudes as positive or negative feelings that individual holds about objects, persons or ideas.

The learners join school with prior experiences upon which the teacher draws and further organizes these experiences into mathematic concepts. The learners are clear about what they expect from teachers' and teachers' also feel that they know what they expect from learners. This causes conflict in which the teachers' emerge as winners. The learners start viewing the teacher as an authority. The role of the teacher is to give learners formal education in mathematics subject most suitable for their abilities and environmental interests. It is important that teachers' understand the attitudes of their students towards mathematics because by so doing, they will help them develop positive attitude towards the subject. This is a very important ingredient in desirable performance in mathematics. Attitudes are mental super positions that express the connections between situations. For example a child who expresses that mathematics is an important and useful subject which should be taught in school, is an effect expressing a relationship between mathematics and how people regard it as a school subject.

Attitude has been defined by Bell (1980) as a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individualsô response to all objects and situations with which is related.ò From the above definitions, attitudes can be seen to be learned and not innate. Attitudes can also be modified by experience and persuasion. Thus it should be possible for the mathematics teachers' and all other teachers' to change the attitudes of students'.

A report showed that most of the children tested in a study in California involving four hundred and fifty nine Junior High school students felt that they knew when their feelings towards arithmetic were developed. Grade three (3) to eight (8) and especially grades five (5) to seven (7) (approximately age ten (10) and twelve (12) were most significant for attitude formation (Dutton 1985). He also asked them if their attitudes had changed at all in the course of their careers. About a third (1/3) of the children claimed that they had probably changed. This data collectively would suggest that attitudes according to Dutton are a factor of the immediate syllabus and may not be deeply rooted.

The crucial period in developing attitudes in a child seems to lie in the infant where his first formal acquaintances with arithmetic is meant there after, should proceed at a place

commensurated with his understanding so that he is not baffled on the one hand or bored on the other(Griffins1963). Another study suggested that the faulty development of concepts was probably the most likely cause of ñthe strong dislike and even fearò which many intelligent adults were known to manifest towards arithmetical operations. This conceptualization place the origin of the phenomenon as far back as the infant school where critics of the current practice asserted that while children were taught perhaps to calculate the number understanding was rarely developed. If the young child did not grasp the significance of number operations at this stage, subsequent arithmetic lessons were only meaningless and puzzling (Churchill 1958)
Students' attitude towards mathematics was positive in the early years of primary schooling but a decline appeared as they progressed to higher levels. It should be noted that at secondary school level the teachers' should try as much as possible to sustain positive attitudes towards mathematics for better performance in the subject (Begle 1973).

The effect of these attitudes on performance was an important aspect in this study. Pritchard (1935) pointed out that boys and especially girls dislike arithmetic because of a feeling of incapacity and strain when dealing with difficult items in the curriculum. Freeman (1948) quoted inability to master technical difficulties as the most frequently expressed reason for not liking arithmetic. Freeman however noted improvement in the students' attitudes towards arithmetic possibly due to the overhaul of the syllabus and improvement of the teaching techniques apparent from previous studies such as Pritchard work in 1930s.

Another finding showed that some University students were interviewed. Pioffernberger and Norton (1956) interviewed a group of sixteen (16) university students' to explore previous influences upon attitudes towards arithmetic and mathematics. They found out that parental influence had a great impact on the learnersô initial attitudes and do affect their achievement. They also claimed that the personality of the teacher and whether they were liked and disliked also influence the learnersôattitude towards the subject. According to them liking for the teacher was closely related to the fear of failure, which the learners might have experienced. The more they liked their teachers the more anxious they became that they may not fail and thus offend their teacher. Liking for teachers also serve as a motivator to the learners. This influenced them to work harder in mathematics since the teacher has a pleasant personality in their view.

A study conducted by Kibanza (1980) found out that pupilsô score on the attitude towards mathematics co-related significantly with pupils achievement scores in mathematics at 0.01 and 0.05 levels. Oketch (1982) reporting Aiken noted that there was a modest positive relationship between attitudes and achievement in elementary school mathematics. Mwangi (1986) observed that a very significant relationship existed between attitudes towards mathematics as a process of enjoyment and performance in mathematics.

However he found no significant relationship between attitudes about the place of mathematics in society and attitude towards mathematics teaching. A study of relationship between achievement and attitudes towards mathematics among students in Nairobi found out that attitudes towards mathematics and achievement were positively correlated (Ogoma1987).

However the magnitude of correlation was found to be statistically significant. Irumbi (1990), in his study on pupils' characteristics, that affect performance in mathematics, found out that attitudes played a vital role in determining the pupils' performance in mathematics since those pupils with positive attitudes failed in the examination in his sample. Dutton and Blum (1968) reported no consistent relationship between pupilsô relative preference for mathematics and the achievement level. Chase (1958) came up with similar findings. The inconsistence of these findings may have been due to poor research designs and the type of instruments used which are often of questionable validity.

A number of studies have been carried out to study the attitude of school teachers towards mathematics. The research findings showed that attitudes towards mathematics were gradually acquired through the students' interaction with learning process and the curriculum. In a study by Dutton (1962), the researcher investigated the changes in attitudes of prospective elementary teachers towards arithmetic since 1954. The study reviewed that 35% disliked arithmetic, 24% liked arithmetic fairly well. The study further showed that prospective elementary school teachers tenaciously held attitudes towards arithmetic once developed. Teachersô attitudes are believed to be an important factor in determining the teaching and learning of mathematics. If teachers' attitudes were positive towards mathematics, it could in turn affect students learning and hence their performance in national examinations. Cockroft (1982) noted that there is no area of knowledge where a teacher has more influence of attitude as well as understanding of his

pupils than he does in mathematics. During his professional life a teacher of mathematics may influence for good the attitudes for mathematics of several thousand young people and decisively affect many of their career choices.

This indicated that students' attitude towards mathematics had a great impact on mathematics than any other area of knowledge. Gatanzano (1977) giving his experience with perspective students noted that during their first few days of classes, prospective students had a tendency to make one or more of the following comments as mathematics having always been their poorest subject or they will never pass in it.

Such comments indicated to some degree the feelings and emotions of many of the prospective teachers towards mathematics, unless these feelings were likely to reflect the same attitude and to achieve accordingly. Those sentiments were in agreement with Johnson (1967), who noted that it is the attitudes which were built that are highly involved in the learning and retention of our subject, and it is often the attitudes the teacher builds that are the basis of your rank as a successful teacher. This indicated that if a pupil developed a positive attitude, then the chances of liking a subject and at the same time performing well were increased.

2.7 **Relationship between attitude and performance**

A study by Aiken (1970) studied the relationship between attitude and performance and concluded that: ñthe relationship between attitude and performance is certainly the consequence of a reciprocal influence in that attitude affects achievement and it in turn affects attitudes.ò Looft (1971), Parker (1974), Warmani (1980) and Thuo (1984) found a strong relationship between achievement in mathematics and attitudes towards mathematics. Munguti (1984) in a study of factors affecting teaching and learning mathematics in Mbooni district found out that teachers attitude towards mathematics was a factor that may affect the teaching of mathematics. Similar findings were found out that teachers' attitude was being reflected in the students' poor performance (Mwangi 1956). Syndoam (1972) studied teachers as a possible source of pupils' attitude towards mathematics. He found out that no evidence to the effect that teachers' attitudes affect pupils' attitude towards the subject.

In conclusion, these studies hold overwhelming opinion in favour of the view that teachers' attitude towards mathematics is an important factor in learning mathematics. The problem of attitude towards mathematics and how it influences performance is quite serious at the higher levels.

2.8 Professional qualification of mathematics teachers in students' performance

Much of the literature in mathematics education by scholars such as Muhandik (1983), Riungu (1985), Kathuri (1986), Kirembu (1991) and Magoli (1992) seemed to indicate a universal belief that a professionally trained teacher contributed more positively to effective learning that untrained teacher.

This was the reason why teacher training existed as a major part of education systems throughout the world. According to Eshiwani (1985) qualification of a teacher was a very important indicator of the quality of education provided. Eshiwani noted that in (1980), seventy percent (70%) of the teachers in Kenya were trained while thirty percent (30%) were untrained. In 1981, the respective figures were sixty six percent (66%) trained teachers and thirty six percent (36%) untrained. Today the status of teaching profession needs determination.

Many parents and educators had often expressed their concern about the poor performance of students in mathematics and that teachers shouldered most of this blame mainly due to lack of training (Muhandik 1983). According to the report of the national committee on educational objectives and policies (Gachathi 1976), the role and quality of teachers must be given the most critical consideration. The report also noted that the qualitative improvement of education can only occur if there is a major improvement in the quality of the teachers and teacher training.
Studies by Riungu (1985), Eshiwani (1974) and Kathuri show a general agreement that the qualification of teachers is of crucial importance in students' performance in mathematics.

Teachers training should therefore stress the issue of quality. Smuthers (1990) observes that in reference to training of teachers that instead of remaining pre-occupied with entry qualifications the new tact would judge the ability of aspiring teachers to meet specific criteria of a good classroom teacher. Kiragon reporting Hus'en (1978) observed that in the developing world research evidence showed that trained teachers made a difference and in particular, she said that

qualifications experience and amount of education and knowledge were positively related to students' in achievement. As noted by Muthwii (1981), in Kenyan schools, there were two types of teachers.

There were the trained who had no grades but had different levels of academic achievement or attainment. At secondary level there were trained graduate teachers, approved teacher status (ATS), graduate untrained teachers Diploma in education teachers and ñAò level untrained teachers. Training and lack of training for teachers affected studentsô performance in mathematics. The untrained teachers relied on their academic qualifications to teach. The researcher found it necessary to find out the relationship between the various academic and professional qualification of mathematics teachers and students performance in mathematics.

2.9 Impacts of teachers' teaching experience in students' performance in mathematics

According to Irumbi (1990), teaching experience was frequently included as a variable in educational research, but no other feature of its effects emerge. Barness (1985) pointed out that teacherôs effectiveness, while it may have increased through the early years of teaching, it may not have directly followed the same pattern in the later years of teaching.

This was observed in longitudinal studies conducted by Fuller and Felder (1972) which documented stages in the development of teachers and focused particularly on the concerns. Barness (1985) observed that the teaching career probably did not continue to do so. He asserted that the teaching career certainly did not do so in a linear fashion. He noted that, as suggested in a substantial proportion of the studies, increased teaching experience at least after the early years in the classroom, was associated with tendency for teachers to reject innovations and alterations in educational policies. A study by Sithu (1982), seemed to contradict this when he suggested that a successful teaching experience is also a variable asset. It will enable a person to acquire certain commendable characteristics such as promptness, adaptability, efficiency, technique of arousing and maintaining interest, adequate comment of instructional materials and ability to face the class with confidence. The relationship between teaching experience of teachers and secondary school students' performance in mathematics is of paramount importance and was thus studied.

2.10. Gender disparity of mathematics teachers in students' performance in mathematics

One of the major factors to be considered in this study, in relation to performance in mathematics is the gender of mathematics teachers. Research studies conducted both in western countries and in Africa have found gender in achievement of mathematics in favour of male mathematics teachers over female mathematics teachers. A study by Jarvis (1964) tested thirty female mathematics teachers and thirty six male mathematics teachers of the sixth grade arithmetic fundamentals and reasoning. The teachers were placed in three groups according to their performance quotient course. The major finding was that in general sixth grade male teachers of all performance levels were slightly superior to their female counter parts in arithmetic reasoning.

More specific evidence for this was reported by Tyler (1958) and Annastacia (1958) who in a survey of gender differences in aptitude and achievement reported that female teachers usually do better in verbal and linguistic tasks and male teachers generally had stronger and special aptitudes and did better in tests of arithmetical reasoning. Evidence from around the world that there were gender related differences in mathematical ability was inconsistent. Differences in attainment in mathematics, as measured by public examination scores were well documented in Britain and many other countries. In Britain little difference had been reported at the secondary level. Leder (1985) also pointed out a few consistent sex related differences at the primary level. In Russia, however it was claimed that such marked differences were not evident. Concluding from his studies of mathematical ability of males and female Krutetskii (1976) noted that there was no clear evidence of any differences. Reasons for differences in attainment had been investigated from a variety of different stand points including biological, psychological and sociological. The best conclusion emerges in the domain of societal attitudes and experiences.

Another finding by Russel (1983) reported that pressures of performance might work equally, unfairly against individuals from gender in that female teachers were not encouraged to opt for mathematical studies. Male teachers were however encouraged even when their ability and interests in the subject were at best, barely adequate. Males often opt for mathematics because it is expected of them and not because they enjoyed the subject. The findings always appeared to have conveyed the message that mathematics was a male subject and that certain other subjects were female subjects.

Peer pressure groups therefore added to the difficulties faced by female mathematics teachers when choosing subjects in colleges/universities. Russel (1983) also drew attention to the male teachers and female teachers regarded themselves in relation to mathematical ability. Female mathematics teachers tended to under estimate their potential whereas male mathematics teachers tended to overestimate their potential. Male mathematics teachers displayed confidence about their ability in mathematics, which was sometimes not justifiable, while female mathematics teachers perhaps with better test results displayed unjustifiable anxiety. The school environment also creates other difficulties for the female mathematics teachers.

Most mathematics teachers were men. Many text books, presumably unknowingly, insinuated a male model or image to mathematics. Some books included men and boys, into the text and exercises left out women and girls almost completely. This could have been due to the fact that, many authors perhaps, because they were male made mathematics in a context, which was of a greater interest to males than females.

Male teachers during mathematics lessons are allegedly of interacting more in the classroom with the boys than the girls and gave more positive encouragement to boys than girls in mixed schools. Some research studies show that female mathematics teachers achieve more in mathematics in a single gender school than they do in mixed schools. Male mathematics teachers on the other hand tended to perform better in mixed schools than boys schools. All these variables or influences result in differences in performance of mathematics. Leder (1985) concluded sex differences possibly due to biological constraints are drafted by the far greater pressure imposed by social and cultural stereotypes about cognitive skills and occupations.

Attention thus needs to be paid to the mathematics to improve performance for both genders. In a discussion of differences between intelligence and special ability, males and females, Hutt (1972) clearly accepted that there were factors, which originated from the biological and psychological domains. The main differences raised, reported by Horton (1991) are as follows: First, scores obtained from applying tests designed to measure overhaul intelligence or ability consistently produced different distribution for males and females.

The scores for males tended to spread more widely across the range whilst the scores for females are more clustered around mean. The difference is not a large one but there was tendency for males to predominate in extremes, the most able and the least able.

Secondly, males are said to excel in spatial ability while females excel in verbal ability. Thirdly, females were much more superior in both manual dexterity and in the role learning ability whereas tests of divergent thinking tend to produce higher scores for males. These differences between genders were however very small and thus conclusions were to be drawn carefully. Benbow and Stanley (1950) carried out research involving intellectually gifted pupils. Their results which were disputed by other researchers, suggested that sex differences in achievement and attitudes towards mathematics result from superior male mathematical ability which may in turn be related to a greater male ability in special tasks.

A study by Eshiwani (1974 sought to determine if there were gender differences in the learning of mathematics. He uses a sample of four classes from four high schools in Nairobi and noted that gender differences exist as shown by studies done in the Western countries.

This study also reveals that there were significant differences in favour of boys in arithmetic reasoning and one in probability tests. He further observes that slight differences are found in favour of boys on attitudes towards mathematics. Although this area of gender differences of achievement in mathematics had been a field of great deal of research work, there seems not to be conclusive findings. The sex differences may have been due to the age of the pupils, their socio-economic and cultural backgrounds or other factors. Hence the research findings vary from country to country or from one educational level to the next. Gender disparities however seem to have important bearing on the mathematics achievement of the students and that differential attainment of the sexes are important when designing a curriculum for schools. This research is based on secondary students that is, Kenya Certificate of Secondary Education (KCSE) candidates in particular in order to find out whether there existed a gender difference of mathematics teachers in studentsô performance in mathematics.

2.11 Students' career aspirations in students' performance in mathematics

Several studies indicate that pupils aspiration to some extent influence their scholastic performance. This is easy to understand when one recognizes that education is thought as a preparation for the future. On this basis, students' present learning is influenced by the future plans or aspirations. A student whose aspiration is to become an architect or an engineer or a pilot will work hard in mathematics and other related subjects and hence show a relatively higher achievement in mathematics. A student whose aspiration is to become a mechanic at certificate level will not put a lot of emphasis in mathematics, leading to a relatively low achievement in the subject. Therefore future aspirations have a big bearing on performance of mathematics.

A study by Hus'en et al (1967) investigated the relationships between pupilsô educational career plans and mathematics. It is hypothesized that students who plan for higher education and have aspirations for higher education perform better than students who do not have such plans when the level of mathematics is held constant. This hypothesis is studied by means of partial correlations between mathematics scores and educational plans as well as aspirations, holding the level of mathematics constant.

2.12 Conceptual Frame Work

The conceptual framework as depicted in the figure 1 shows a number of factors that influence performance of mathematics. The variables investigated in the study include:

a. Students' attitude towards mathematics in their performance in mathematics.

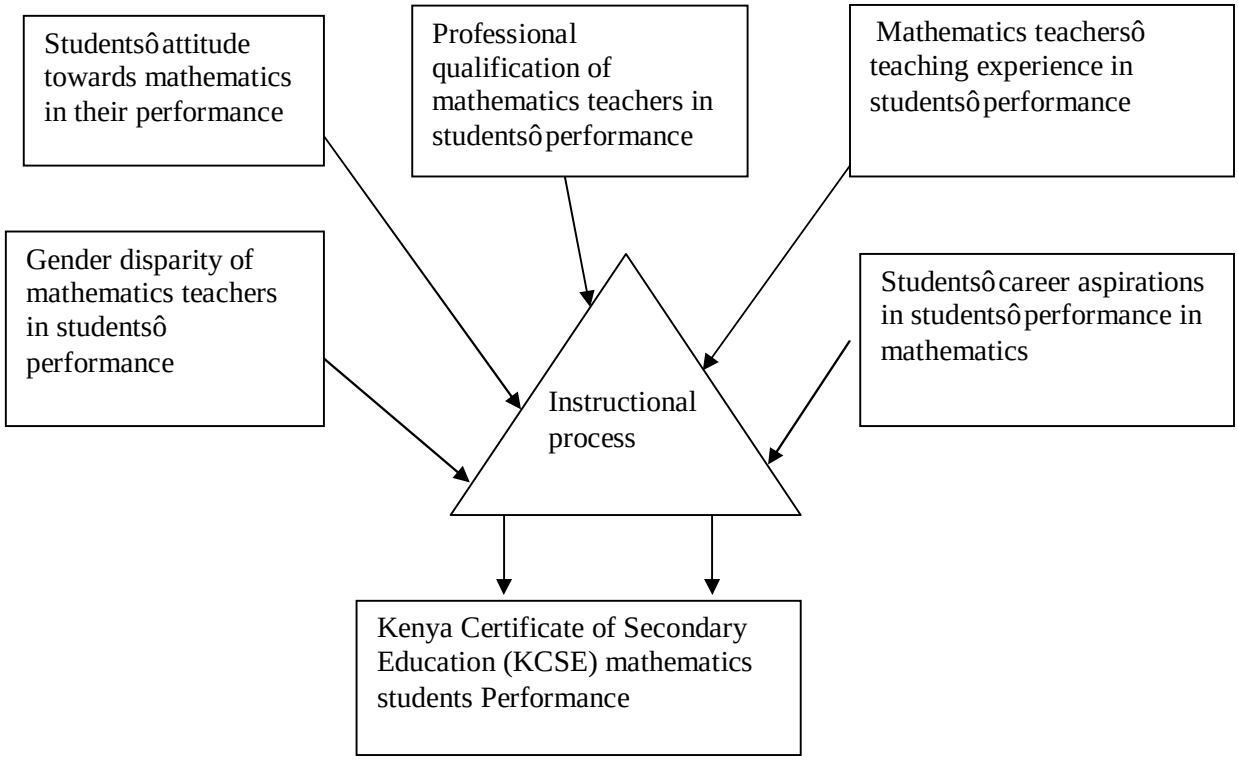
b. Professional qualification of mathematics teachers in studentsôperformance.

c. Impacts of teachersôteaching experience on studentsôperformance.

d .Effects of gender disparity of mathematics teachers on studentsôperformance in mathematics

e .Students' educational career aspirations in studentsôperformance in mathematics

Figure 1.Conceptual framework of the study



The diagram above illustrates that positive studentsô attitudes towards mathematics, professional qualification of mathematics teachers, mathematics teachersô with teaching experience, gender disparity of mathematics teachers in studentsô performance in mathematics and studentsô career aspirations as well as studentsô performance in mathematics lead to teaching which in turn results to an improved academic studentsô performance in mathematics.

CHAPTER THREE
METHODOLOGY OF THE STUDY

3.0 Introduction

This chapter discusses methods that were used to provide data in this study, research design, sampling procedures, population of study sample, research instruments, data collection and analysis, locale that is stating simply the location of the study in other words where the study was conducted.

3.1 Research design

This research project is a survey research design using descriptive method where teachersô and studentsô views on the factors influencing performance in mathematics in the Kenya Certificate of Secondary Education (KCSE) were collected and analyzed. Isaac and Michael (1981) noted that survey design in education is conducted to determine status quo and gathering of facts rather than manipulation of variables. The study was designed to obtain views from learners/students, mathematics teachers and secondary school principals.

3.2 Target population

This research project covered five secondary schools in Kathozweni district, Makueni County. This is 10% of the total fifty secondary schools in this district. The respondents were five principals, ten mathematics teachers, two hundred students whereby the researcher was using forty students from each school, excluding form one students who are not familiar with secondary school system.

3.3 Locale

The study was conducted in Kathonzweni district, Makueni County, Kenya, targeting principals, teachers and learners in five secondary schools. Kathonzweni district is a new district curved from the larger Makueni district.

3.4 Sample and sampling techniques

Sampling is the process of selecting a sufficient number of elements from the population so that a study of the sample and understanding its properties and characteristics will make it possible to generalize such properties or characteristics to the population elements Borg and Gall (1989).

The sample for this study was selected using a simple random sampling design. The minimum sample for a survey of a small population is 20% and that of a large population is 10% Ary, and Razarieth (1972).

The respondents in this study were five principals, ten mathematics teachers, two hundred students in five secondary schools, i.e forty students from each school. Random sampling was used to select the respondents for the study. In five secondary schools respondents were selected from forms 2, 3 and 4. Form 1s were left out because of their little knowledge about the secondary school systems as they were fresh from primary schools. All respondents of the study were randomly selected.

3.5 Research instruments

The study instrument that was selected was questionnaire.

3.5.0 Questionnaires

The researcher developed questionnaires for the teachers. Gay. (1972) observes that, questionnaires give detailed answers to complex problems and they are most effective for use in surveys. Fowlr, E. (1995) observes that the use of questionnaires is a popular method for data collection in education because of relative ease and cost effectiveness with which they are constructed and administered to large samples.

Questionnaires give a relatively objective data and most suitable for the survey research design of this study. The instruments comprised of open-ended and closed-ended questions. They solicited information from principals, mathematics teachers and students. The researcher used questionnaires because of the possibility of using distant respondents who in this case were found in school thus saving time as research assistants collected questionnaires. The questionnaires were both intended to seek views, opinions and factual information from school principals, mathematics teachers and students.

3.6 Validity and reliability of research instruments

Validity of the instruments is the degree to which a test measures what it is supposed to measure. A test is normally valid for a particular purpose and for a particular group. In general, the

instrument is valid if it measures what it claims to measure James and Sally (1989). Reliability of the instruments is the degree to which a test consistently measures what it measures. According to Isaac and Michael (1981) the more reliable a test is, the more confidence we can have that scores, obtained from the administration of the test are essentially the same scores that would be obtained if the test were repeated. The questionnaire for teachers was used in the pilot study to assess reliability.

3.7 Piloting

To ascertain the validity and reliability of questionnaires, the researcher conducted a pilot study in one of the secondary schools in the district. The questionnaires were administered to principals, mathematics teachers and students of the five selected secondary schools. Pilot study also provided valuable information concerning how long the survey could take. The purpose of piloting was to find out whether the items of instruments were precise and comprehensive enough to provide the anticipated type of data and determine whether research objectives were fulfilled after which appropriate changes were made in the instruments. According to Borg and Gall (1989), the purpose of piloting is to assess the clarity of the instruments and the suitability of the language used in the instruments. He continues to say that a pilot study is used to measure the validity and reliability of the instruments. From the pilot study, the researcher made changes on questions which were found to be ambiguous and confusing.

The researcher carried a pilot study, developed a budget and time schedule, completed sampling and finally collected data before analyzing it. He gave the respondents sufficient time to respond to the questionnaire.

3.8 Data collection procedure

The researcher trained research assistants and some teachers to assist him in collecting data Moreover the researcher gave the respondents (principals, mathematics teachers and students) sufficient time to respond to the questionnaires.

3.9 Data analysis technique

The data analysis involved preparation of the collected data i.e. cleaning, coding and editing of data. The descriptive data analysis was done using quantitative techniques. Quantitative data

was analyzed using mean scores, frequencies and percentages that were presented using tables, charts and graphs. Inferential statistics such as the regression model was used to analyze the relationships between the variables of the study.

CHAPTER FOUR
DATA ANALYSIS AND RESULTS

4.0 Introduction

This chapter presents the research findings and data analysis results. The objectives of the research are: to establish how studentsô attitude towards mathematics influences their performance in the Kenya Certificate of Secondary Education (KCSE) examination in Kathonzweni district; to investigate how professional qualification of mathematics teachers influence studentsô performance in mathematics in the KCSE examination in Kathonzweni district, to establish how teaching experience of mathematics teachers influences studentsô performance in mathematics in the KCSE examination in Kathonzweni district; to establish how gender disparity among teachers influence performance of secondary school students in the KCSE examination in Kathonzweni district; to investigate how studentsô career aspirations influences studentsô performance in the KCSE examination in Kathonzweni district. The research was of a descriptive nature and thus the data was analyzed using percentages, charts, bar graphs and tables.

4.1 Questionnaire response rate

The Kathonzweni district education office has indicated that there were thirty nine mathematics teachers in the twenty five secondary schools in the district. However, after visiting the five selected schools, the researcher established that the number of mathematics teachers in these selected schools was actually ten. The questionnaire was administered to all the ten mathematics teachers and they all responded. This represented 100% return rate of mathematics teachers.

Out of the twenty five principals, five principals were taken randomly of whom their five secondary schools were visited and they all responded. This represented 100% return rate of principals. Among the two hundred students visited only one hundred and sixty one responded. This represented their return rate of 80.5%.

The above observation shows that a sizeable number of the respondents targeted gave their responses to the research instruments. Table 5 shows the statistics of the respondents who gave their responses.

Table5: respondents who gave their responses

respondents	Sample size	Actual response	percentage
Students	200	161	80.5
Mathematics teachers	10	10	100
Principals	5	5	100

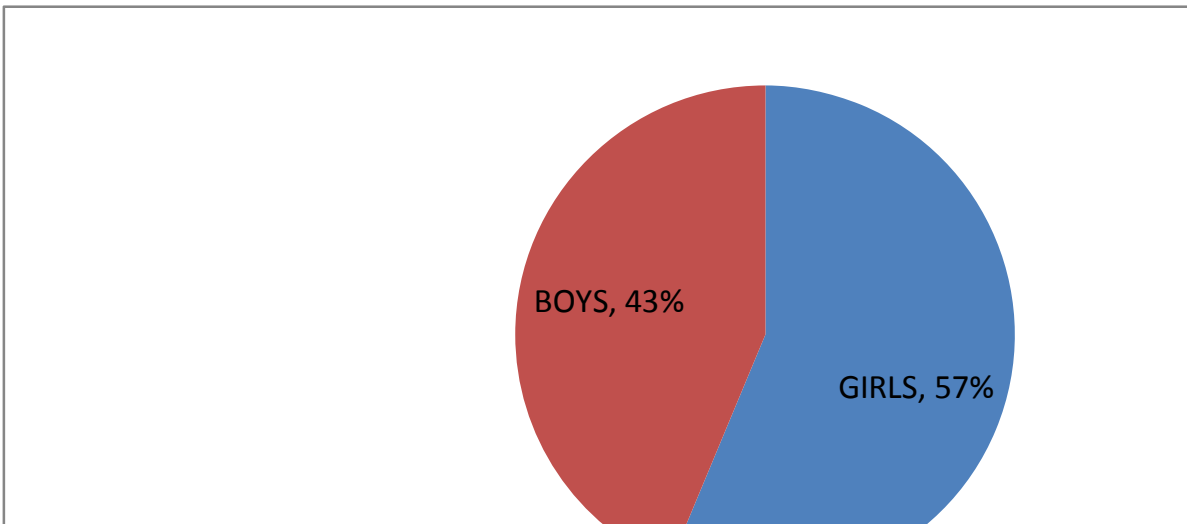
According to table 5, the average response rate was 80.5% for the students, 100% from mathematics teachers and 100% for principals. This response rate was considered sufficient to provide a reliable response to the research findings.

4.2 STUDENTS' RESPONSE

Section A: students' demographic information

The learners were asked to state their gender. Figure 2 shows the responses obtained.

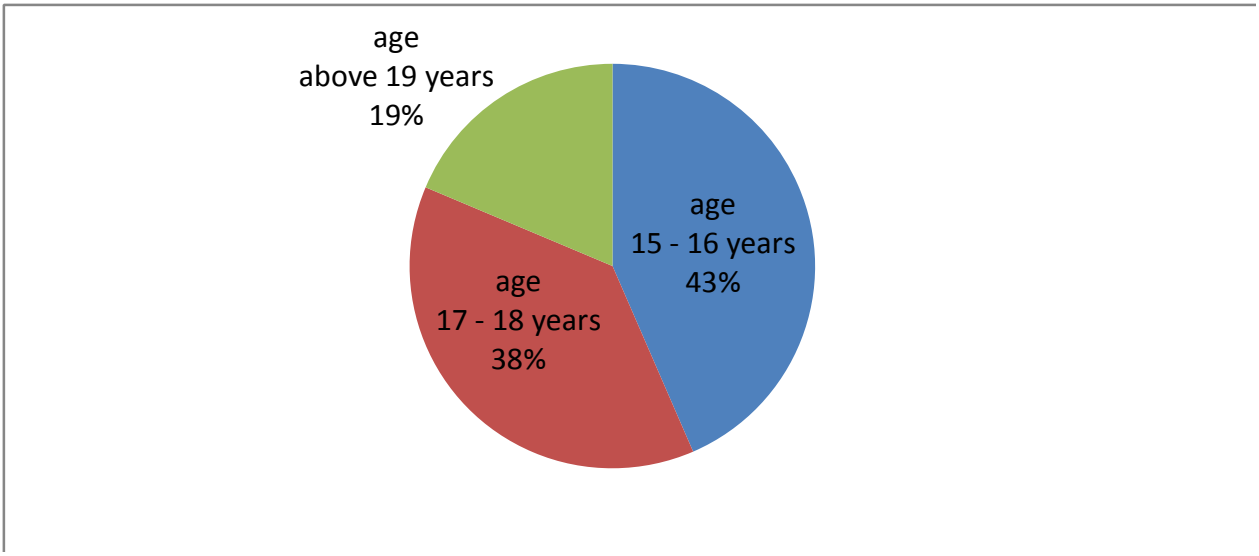
Figure 2: Gender distribution of students



According to figure 2, girls are more than boys as they are represented by 57% and 43% respectively. This tends to affect the girlsô performance in mathematics according to the study carried out by Eshiwani (1974). Whereby he revealed that there were significant differences in favour of boys in arithmetic reasoning.

The researcher also sought to find out the age of students and the following figure illustrates their findings.

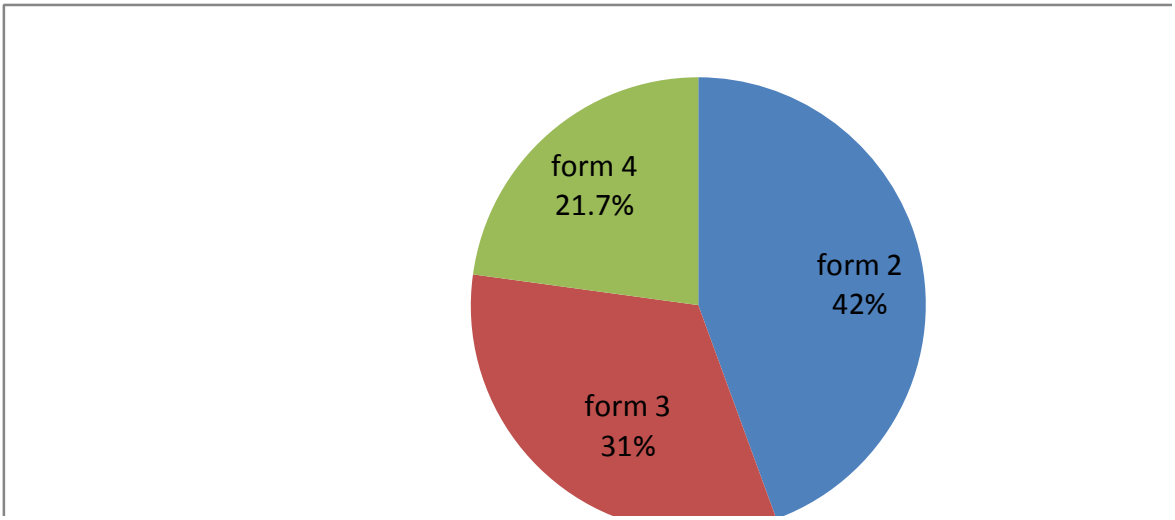
Figure 3: Distribution of students' age



According to figure 3, majority of the learners aged between 15 to 16 years as this is represented by 43.47%. Between 17 and 18 years were represented by 37.9% while above 19 years was represented by 18.63%. This showed most of the learners were in their tender age.

The learners were asked to state the classes they belonged. Figure 4 shows the findings of the study.

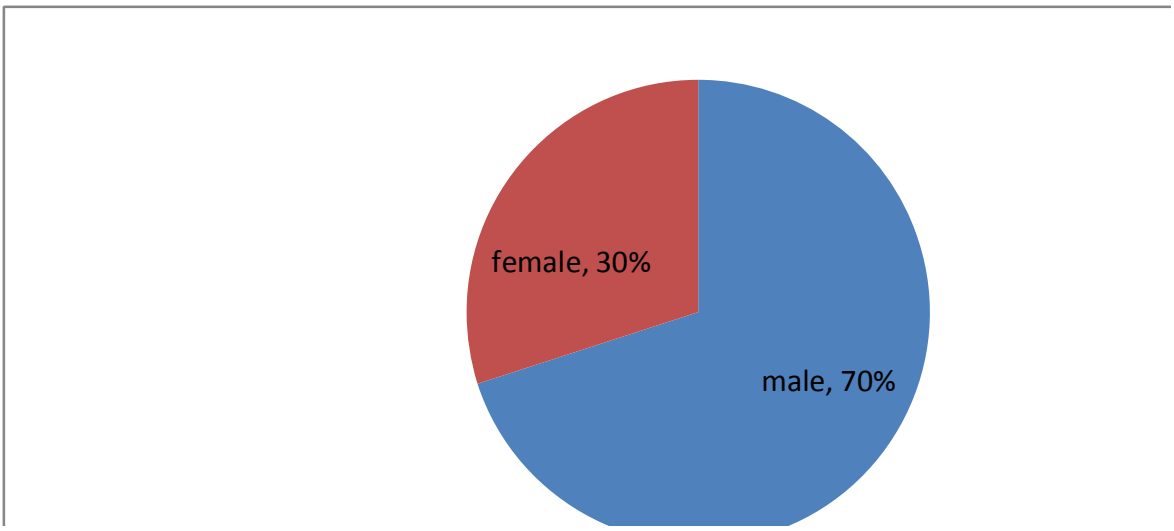
Figure 4: Class distribution of students



According to figure 4, majority of the learners belonged to form 2 as it constituted the highest percentage which was 42.2% while forms 3 and 4 were represented by 31.1% and 21.7% respectively. This showed that there was drop rates which affected their performance in mathematics in the KCSE examination.

The learners were further asked about the gender of their mathematics teachers. Figure 5shows their response of the findings.

Figure 5: Mathematics teachers' gender distribution



According to figure 5 above majority of mathematic teachers were males as this was represented by 70% while 30% represented female teachers.

Further on demographic information of students, they were asked of whether they have ever repeated any class. Figure 6 shows the responses obtained.

Figure 6: Students' repetition in class

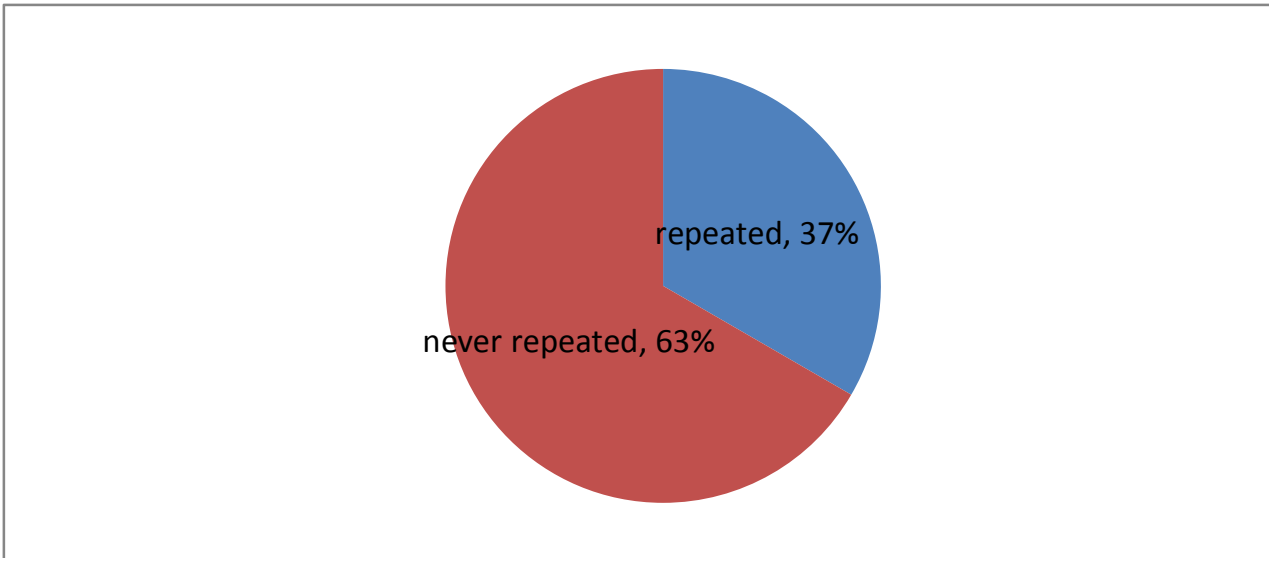


Figure 6 shows that out of the 161 students only 51 students repeated. This was represented by 37% while 110 never repeated any class. This was represented by 63%. This showed that majority of students never repeated any class.

Still on studentsô demographic information the students were asked to state the people they live with in their families. Figure 7 shows the findings of the study.

Figure 7: Guardians'/parents distribution

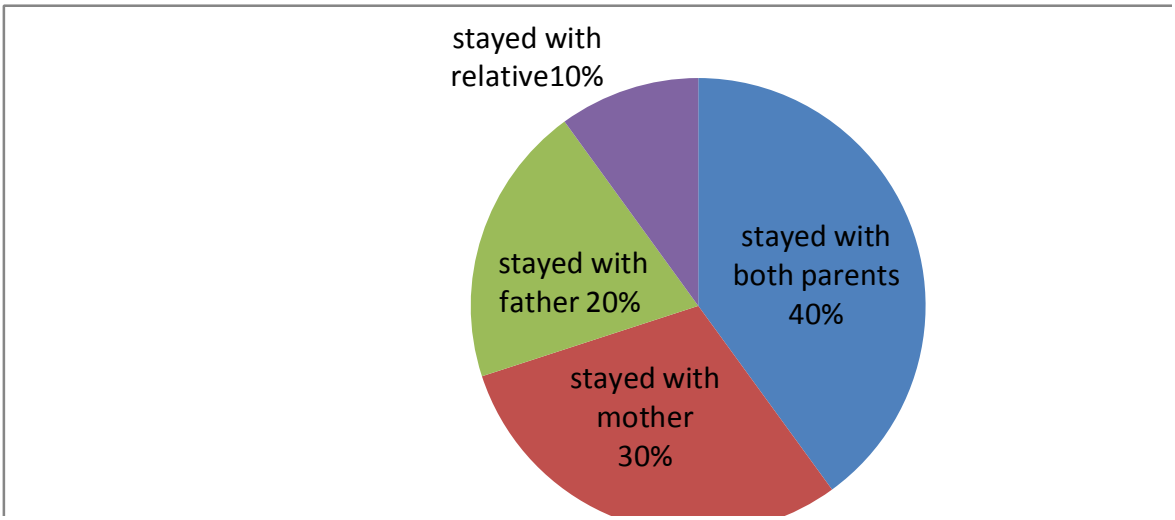


Figure 7 shows that majority of the learners stay with both parents which constituted 40%. Those who stayed with their only mother were represented by30% while those who stayed with their father and relative were represented by 20% and 10% respectively. This shows that most of the learners lived with both parents.

The learners were asked to state how far were their homes from school. Figure 8 shows their responses.

Figure 8: Students' distance distribution from their homes to their schools.

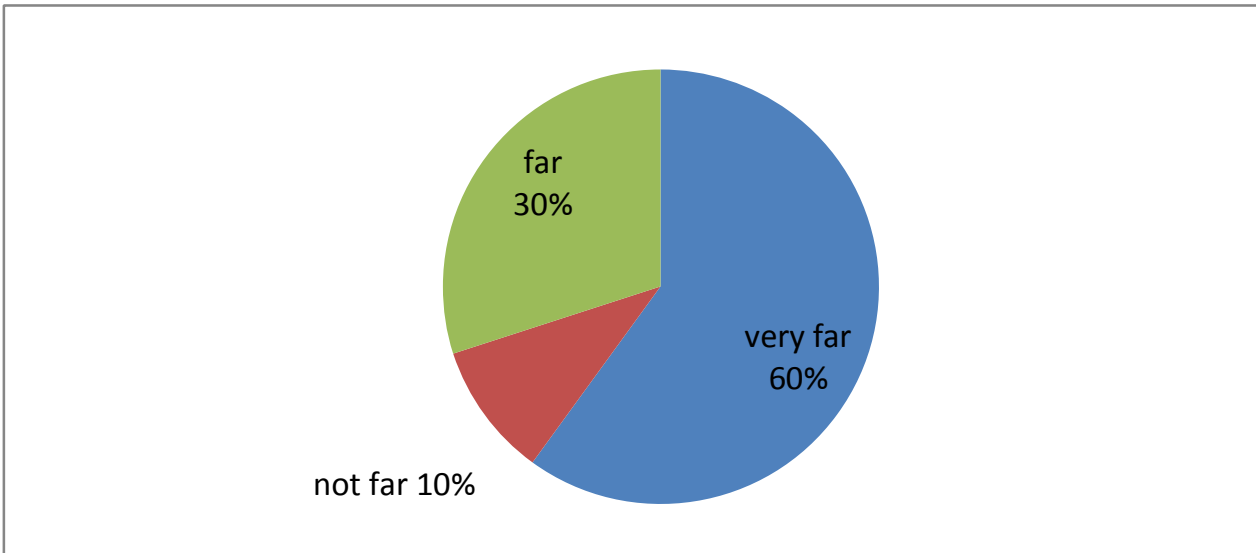


Figure 8 shows that majority of the students homes are very far from their schools. This is represented by 60%. Far and not far were represented by 30% and 10% respectively. This shows that studentsô perform poorly in mathematics because of the long distance they cover from their schools and back to their homes.

The learners were asked to state the occupation of their parents.

Figure 9: Distribution of the occupation of learners' parents

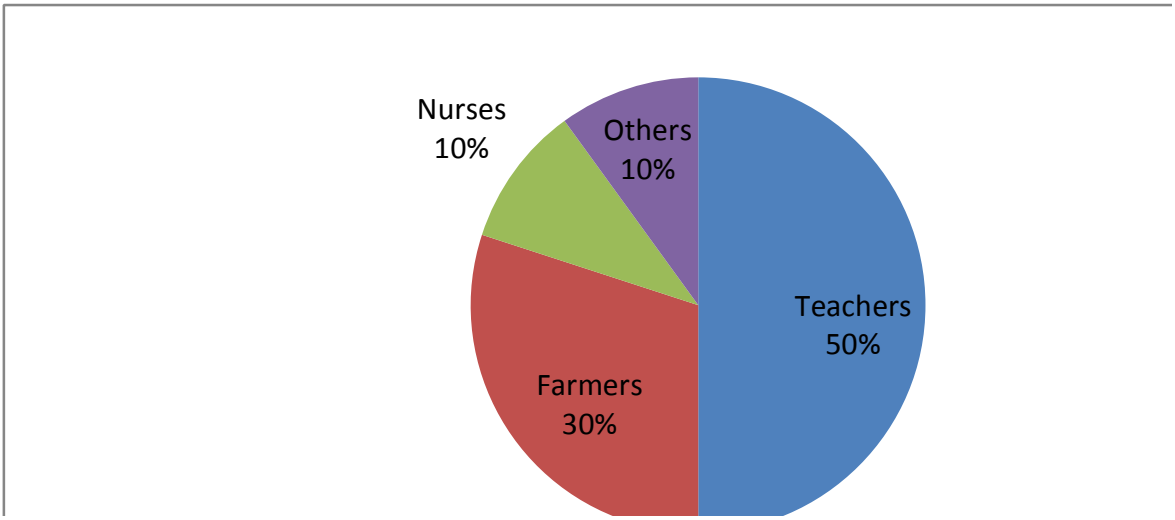


Figure 9 shows that most of the learnersô parents were teachers as this is represented by 50%. Farmers were represented 30% while nursing profession and other professions constituted 10% each. This affects the learnersô performance in mathematics because of their parents being teachers whereby they tend not to choose teaching profession.

4.2.0 Students' attitude towards mathematics

The study sought to analyze how studentsô attitude towards mathematics influences their performance in the KCSE. When asked the percentage they normally score in mathematics, the following table displays their responses

Table 6: students' attitude score in mathematics

Range in %	Grade	Frequency	Percentage
85- 100	A	-	-
80 ï 84	A-	-	-
75- 79	B+	-	-
70 ï 74	B	-	-
65- 69	B-	-	-
60- 64	C+	06	3.7
55- 59	C	07	4.3
50-54	C-	06	3.7
45- 49	D+	07	4.3
40 ï 44	D	35	21.7
35 ï 39	D-	40	24.8
Below 34	E	60	31.06
Total	12	161	100%

Table 6 shows that out of 161 respondents, only 3.7% scored C+, 4.3% scored C plain, 3.7% scored C minus, 4.3% scored D+, 21.7% scored D plain, 24.8% scored D Minus, 31.06% scored E. This shows that majority of the students in Kathonzweni district have a negative attitude towards mathematics. Dutton and Blum (1967) noted that attitude determines what students scored. They emphasized that the teachers should be concerned with the development of positive attitudes since the student attitude would only determine the willingness of students to learn mathematics but also his or her use of the mathematics as well.

When asked about what they expected to score in mathematics in the KCSE, table 7 below shows their response.

Table 7. Students' expectations to score in mathematics in their KCSE examination.

Range in %	Grade	No. of students	Percentage (%)
85 ï 100	A	-	-
80 ï 84	A-	-	-
75 ï 79	B+	-	-
70- 74	B	02	1.24
65 ï 69	B-	05	3.10
60- 64	C+	08	4.97
55- 59	C	21	13.04
50 ï 54	C-	30	18.63
45 ï 49	D+	40	24.84
40 ï 44	D	55	34.16
35 ï 39	D-	-	-
Below 34	E	-	-
Total	12	161	100

According to table 7, only 1.2% expect a B plain, 3.10% B-, 4.49% C+, 13.04% C plain, 18.63% C-, and 24.84% D+. None of the students expected a grade of D- and below. This shows that majority of the students expected to score below average in mathematics in their KCSE.

In order to find out studentsô attitude towards mathematics, nine questions were asked. The first question was in whether the students liked mathematics. Below is table 8 which shows the responses obtained.

Table 8. Students' view of mathematics

	Number of students	percentage
Strongly agree	11	6.8
Agree	20	12.4
Disagree	30	18.6
Strongly disagree	100	62.1

Out of 161 students, only 6.8% strongly agreed that they liked mathematics while 12.4% agreed with the statement ôI like mathematicsõ. Those students who disagreed and strongly disagreed constituted 18.6% and 62.1% respectively. This shows that majority of the students have a negative view towards mathematics hence affecting their performance in mathematics.

On question number 15 (ii) Students were also asked whether they are under strain when studying mathematics. Below is a table showing their responses.

Table 9: students' strain when studying mathematics

	Number of students	percentage
Strongly agree	112	69.57
Agree	18	11.18
Disagree	21	11.2
Strongly disagree	10	13.4
Total	161	100

According to table 9, studentsõ who strongly agreed that they were under strain when studying mathematics were represented by 69.57%, those who agreed were 11.18% and those who disagreed and strongly disagreed constituted 11.2% and 13.4% respectively. The findings indicated that majority of the students were under strain when studying mathematics thus affecting their performance in mathematics.

On question number 15(iii) they were further asked whether they enjoy studying mathematics. Table 10 shows their responses.

Table10. Students' joy when studying mathematics

	Number of students	percentage
Strongly agree	5	5.0
Agree	10	6.2
Disagree	34	21.12
Strongly disagree	112	69.57
Total	161	100

According to table 10 above those who strongly disagreed that they enjoyed when studying mathematics are represented by 5.0%. agree constituted 6.2% and those who disagreed that they enjoyed when studying mathematics were represented by 21.12%. Students who strongly disagreed constituted 69.5%. This shows that majority of the students do not enjoy when studying mathematics as majority of the respondents strongly disagreed with the statement ó I enjoy when studying mathematics.ô This affects their performance in mathematics.

According to question number 15 (iv), respondents were asked whether solving mathematics problem is stressful. Table 11 displays their responses.

Table 11: Solving mathematics problem is stressful

	Number of students	percentage
Strongly agree	100	62.11
Agree	31	19.25
Disagree	16	9.94
Strongly disagree	14	8.70
Total	161	100

According to table 11, 62.11% constituted students who strongly disagreed. 19.25% represented those who agreed while 9.4% and 8.7% constituted those students who disagreed and strongly

disagreed that solving mathematics was stressful. This table indicates that majority of the respondents felt that solving mathematics problem is stressful hence affecting their performance in mathematics.

Question number 15 (v), students were also asked whether the mention of mathematics irritates them. Table 12 shows their responses.

Table12. Irritation on students' mention of mathematics

	Number of students	percentage
Strongly agree	70	43.48
Agree	50	31.06
Disagree	21	13.04
Strongly disagree	20	12.4
Total	161	100

According to table 12, majority of the respondents (43.48%) strongly agreed that the mere mention of mathematics irritates them, 31.06% agreed that mathematics irritates while 13.04% disagreed and 12.4% strongly disagreed. This further supports the view that students have a negative attitude towards mathematics.

According to question number 15 (vi) the respondents were asked whether mathematics makes them uncomfortable. The following table indicates their responses.

Table13: Students uncomfortability in mathematics

	frequency	percentage
Strongly agree	80	49.7
Agree	60	37.27
Disagree	11	6,8
Strongly disagree	10	6.2
Total	161	100

In this table, the learners who strongly agreed that they were uncomfortable when studying mathematics were represented by 49.7% while those who agreed constituted 37.2%. Those who disagreed and strongly disagreed constituted 6.8% and 6.2% respectively. This supports the

opinion that students are uncomfortable when studying mathematics hence this affects their performance in mathematics.

Further on question 15 (vii) the study sought to establish from the learners whether they felt lost when studying mathematics. The responses obtained were displayed in table 14 below.

Table14: Students feeling lost when studying mathematics

	Number of students	percentage
Strongly agree	82	50.9
Agree	48	29.8
Disagree	16	9.9
Strongly disagree	15	9.3
Total	161	100

According to table 14 above a slight majority of learners (50.9%) strongly agreed that they felt felt lost when studying mathematics. 29.8% agreed while disagreed and strongly disagreed were represented by 9.9% and 9.3% respectively. This shows the negative attitude students have in mathematics hence this affects their performance.

On question number 15 (viii) the learners were asked whether they had a good feeling towards mathematics. Table 15 below shows the responses obtained.

Table 15: Students' good feeling when studying mathematics

	Number of students	percentage
Strongly agree	20	12.4
Agree	21	13.0
Disagree	40	24.8
Strongly disagree	80	49.7
Total	161	100

According to table 15, majority of the respondents strongly expressed their feeling that they had no good feeling towards mathematics. This is expressed by 49.7% of the students who strongly disagreed with the comment of having a good feeling towards mathematics while 24.8% disagreed while only 12.4% strongly agreed. This shows how learners have a negative attitude towards mathematics thus this affects performance in mathematics.

Finally on question number 15 (ix) they were told to comment of whether mathematics gave a sense of security. Table 16 indicates the responses obtained.

Table 16: Students' sense of security in mathematics

	Number of students	percentage
Strongly agree	12	7.5
Agree	14	8.7
Disagree	60	37.3
Strongly disagree	75	46.6
Total	161	100

According to table 16, those who strongly agreed constituted 7.5%, those who agreed were represented by 8.7% while those who agreed and strongly disagreed constituted 37.3% and 46.6% respectively. This shows the negative attitude the learners have towards mathematics. This affects their performance in this subject.

Finally when they were asked to suggest what they would like to do to improve the teaching of mathematics. Table 17 below shows their suggestions.

Table17. Students' suggestions to improve the teaching of mathematics

	Number of students	percentage
Group discussion	80	49.9
Staffing of mathematics teachersô	40	24.8
Provision of teaching materials such as Text books, revision materials etc	21	13.04
Seminars of mathematics teachers	20	12.4
Total	161	100

Table 17 indicates that the slight majority of learners would like to form group discussion (49.9%). Others suggested to have staffing of mathematics teachers (24.8%), 13.04% suggested provision of learning materials like text books, revision materials etc while 12.4% suggested that their mathematics teachers should be allowed to attend seminars.

As pertaining professionalism of mathematics teachers, the learners were asked five questions. The first question was whether their mathematics teachers were competent. Table 18 shows their responses.

The table 18 below shows the responses obtained from respondents when they were told to comment the competence of their mathematics teachers.

Table18: Mathematics teachers' competence in students' performance

	Number of students	percentage
Strongly agree	30	18.6
Agree	100	62.11
Disagree	21	13.04
Strongly disagree	10	6.21
Total	161	100

The table above indicates that majority of the respondents 62.11% agreed with the statement that their mathematics teachers are competent, 18.6% strongly agreed, 13.04% disagreed, 6.21% strongly disagreed. This shows that mathematics teachers are competent to teach mathematics.

On question number 17 (ii) the learners were asked to state whether their teachers explain concepts well. The table below shows the responses obtained.

Table 19: Mathematics teachers' well explanation of the concept in students' performance

	Number of students	percentage
Strongly agree	84	52.13
Agree	52	32.3
Disagree	15	9.32
Strongly disagree	10	6.21
Total	161	100

Table 19 shows that majority of mathematics teachers explain the concepts well as 52.13%strongly agreed with the statement that mathematics teachers explain the concepts well, 32.3% agreed, 9.32% disagreed and 6.21%strongly disagreed showing that just a few teachers do not explain mathematics concepts well.

Question number 17 (iii) respondents were requested to state whether mathematics teachers mark their assignment books. Table 20 below indicates the responses obtained.

Table 20: Mathematics teachers marking of assignment books

	Number of students	percentage
Strongly agree	102	63.4
Agree	40	24.8
Disagree	10	6.2
Strongly disagree	9	5.6
Total	161	100

Table 20 indicates that majority of the mathematics teachersô mark the assignment books as 63.4% strongly agreed that their mathematics assignment books are marked, 24.8% agreed, 6.2% disagreed while only 5.6% strongly disagreed. This also shows that majority of the teachers mark the assignment books as just a few learners disagreed with the statement.

On question number 17 (iv) students were also asked to state whether their mathematics teachers complete the syllabus in time and table 21 shows the responses obtained.

Table 21: Mathematics teachers' completion of the syllabus in time

	Number of students	percentage
Strongly agree	70	43.5
Agree	50	31.1
Disagree	21	13
Strongly disagree	20	12.4
Total	161	100

Table 21 shows a slight majority (43.5%) of students stated that their mathematics teachers completed the syllabus in time, 31.1% agreed, 13% disagreed and 12.4% strongly disagreed. This showed that in most schools, the syllabus is completed in time.

Further on question 17 (vi) students were asked whether they revise with their teachers in class. Table 22 shows their responses

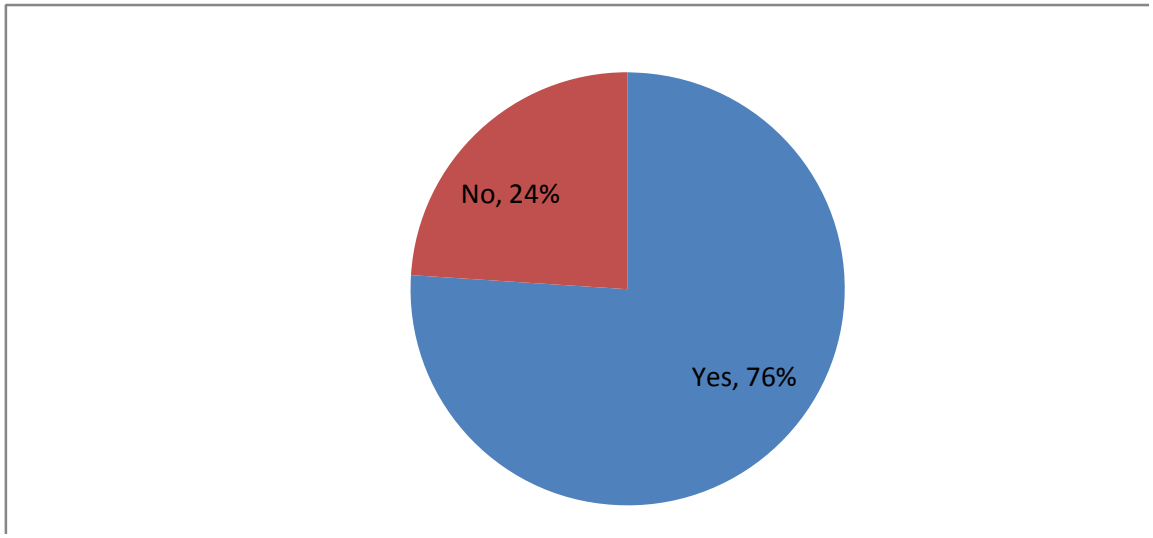
Table 22: Mathematics teachers' revision in class

	Number of students	percentage
Strongly agree	88	54.7
Agree	60	32.3
Disagree	13	8.1
Strongly disagree	10	6.2
Total	161	100

Table 22 shows that at least half of the learners (54.7%) strongly agreed that they revise with their mathematics teachers in class, 32.3% agreed with the statement, 8.1% disagreed while 6.2% strongly disagreed. This indicated that most of mathematics teachers revise with their students in class.

On studentsô opinion of whether there is a difference of teaching mathematics between male and female teachersô figure 10 summarizes responses obtained.

Figure 10: Gender disparity of mathematics teachers in students' performance.



Majority of the respondents (76%) were of the opinion that there is difference of teaching mathematics by male and female mathematics teachers. Only 24% of the respondents were of the opinion that there is no difference of teaching mathematics by male and female. The reason they gave was that male mathematics teachers teach mathematics better than female mathematics teachers. The findings of the study are in consistent with the findings of Tyler (1953) and Anastancia (1958) who in their survey of gender differences in aptitude and achievement reported the female teachers usually do better in verbal and linguistics and male teachers do better in tests of arithmetic reasoning.

4.4 Students' career aspirations in their mathematics performance

In order to find out studentsô career aspirations, the learners were asked three questions. The first question was whether they would like to do mathematics in university or any college after secondary school. Table 23 shows the responses obtained.

Table 23: Students' view to do mathematics in university or college.

	Number of students	percentage
Strongly agree	10	6.2
Agree	20	12.4
Disagree	21	13.04
Strongly disagree	110	63.3
Total	161	100

According to table 23, students who strongly agreed were represented by 6.2%, those who agreed constituted 12.4%, while those who disagreed and strongly disagreed constituted 13.04% and 63.3% respectively. This shows that majority of the learners would opt for other subjects other than mathematics in the university or college.

On question 19 (ii) the learners were also asked of whether they would become secondary school mathematics teachers and the findings were indicated in table 24 below.

Table 24: Students; aspirations of becoming secondary school mathematics teachers

	Number of students	percentage
Strongly agree	3	1.9
Agree	18	11.2
Disagree	22	13.7
Strongly disagree	118	73.3
Total	161	100

According to table 24 those who students who strongly agreed were represented by 1.9% and those who agreed were represented by 11.2%. The rate of the students who disagreed and strongly disagreed constituted 13.7% and 73.3% respectively. The findings show that majority of the learners were not willing to become secondary school mathematics teachers.

On question 19 (iii), the respondents were further asked of whether they would like to do a course related to mathematics. The findings of their responses were indicated in the following table.

Table 25: Students' aspiration to do a course related to mathematics in university or college level

	Number of students	percentage
Strongly agree	9	5.6
Agree	10	6.2
Disagree	22	13.7
Strongly disagree	120	74.5
Total	161	100

The findings in table 25 indicated that the greatest percentage (74.5%) of learners strongly disagreed that would not like to do a course related to mathematics. Those who disagreed were represented by 13.7% while those who agreed and strongly agreed had the lowest rate constituting 6.2% and 5.6% respectively. This shows that the learners would prefer a career that is not so much closely related to mathematics.

4.5 Mathematics teachers' response

For students to perform in mathematics, it was noted that there is need for qualified mathematics teachers at all levels both full time and part time. The current study sought to establish to what extent mathematics teachers are professionally qualified. The facilitators in the selected secondary schools completed questionnaires requiring them to a number of aspects to do with professional qualifications, the terms of employment, their teaching experience, schools, students attitude towards mathematics, rating the methods they use when teaching mathematics and finally suggestions of improving studentsô mathematics performance in the KCSE.

4.5.1 Demographic Information of mathematics teachers

On mathematics teachersô demographic information, mathematics teachers were asked about their gender. Figure 11 shows the findings of the study.

Figure 11: gender distribution of mathematics teachers

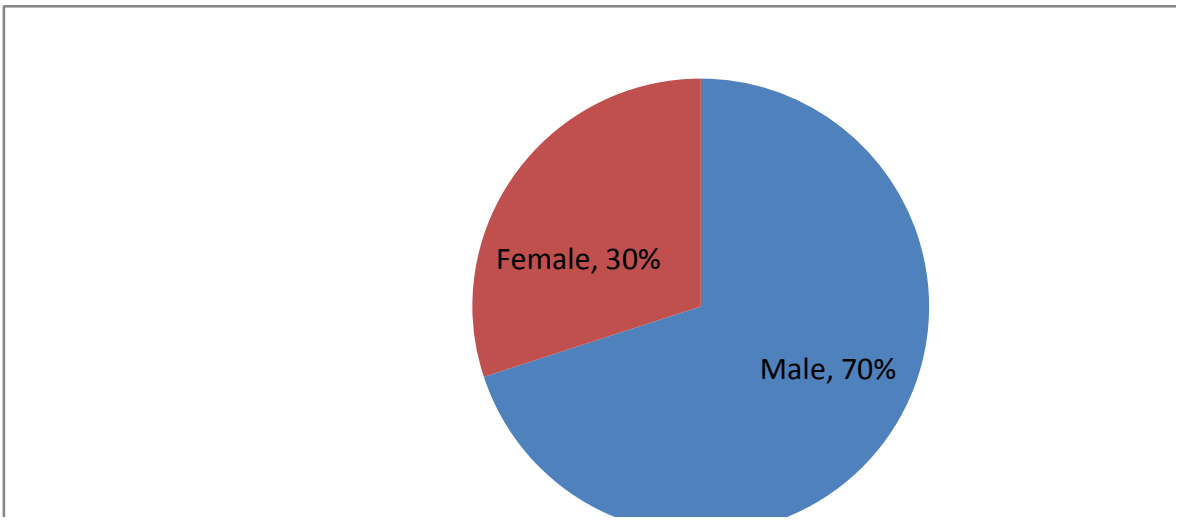


Figure 11 above shows that most of the mathematics teachers are males as this is represented by 70% while female teachers are represented by 30%. The information given by mathematics teachers on their gender in figure 11 conforms with studentsô information about the gender of their mathematics teachers.

Mathematics teachers were also asked of their age. Table 26 shows the findings of the study.

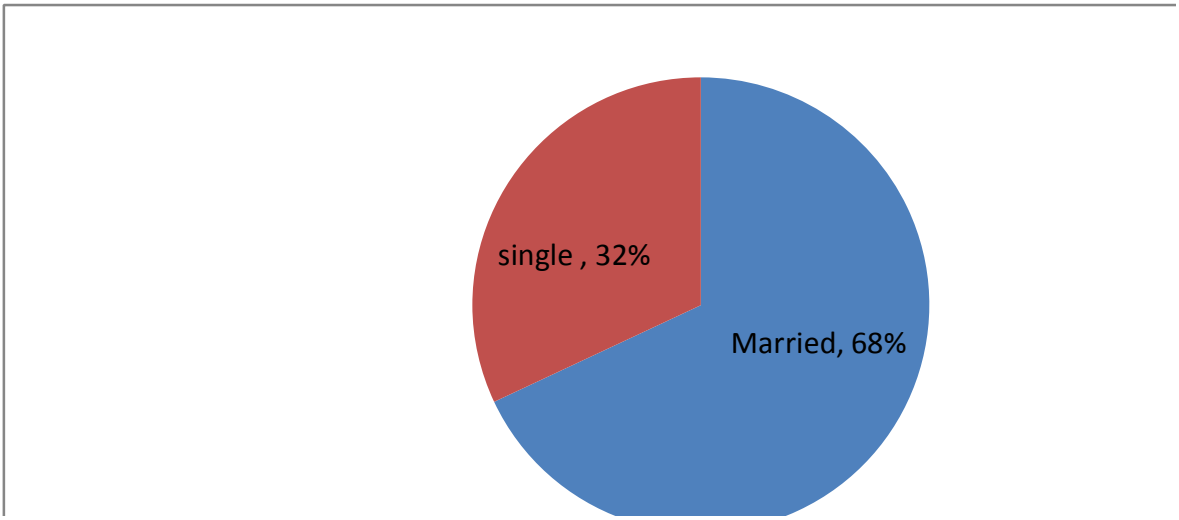
Table 26: Distribution of the age of mathematics teachers

Age of teachers	frequency	percentage
25 ï 30	4	40%
31 ï 35	3	30%
36 ï 40	3	30%
41- 45	0	0
46 ï 50	0	0
Above 51	0	0
total	10	100

According to table 26, mathematics teachers who are aged between the ranges of 25 ï 30 years constituted 40% while those aged between 31 ï 35 years comprised 30%. None of the mathematics teachers was aged between 41 ï 45 years as well as between 46 ï 50 as this is represented by 0%. Also none of the teachers was over the age of 51 years. This is also represented by 0%.

Further on demographic information, the respondents were asked to state their marital status. The pie chart below illustrates the responses of their findings.

Figure 12**: Marital status of mathematics teachers**



According to figure 12 above majority of mathematics teachers were married as this is represented by 68% while only a small portion of mathematics teachers (32%) were single. This implies that a great number of married mathematics teachers concentrate more on their families than teaching mathematics hence affecting studentsô performance in mathematics.

On the professional qualification of mathematics teachers on studentsô performance, the respondents were asked to indicate their professional qualification. Table 27 displays the responses obtained.

Table 27: Professional qualification of mathematics teachers

	Frequency	percentage
Diploma in Education	1	10
Postgraduate Diploma in Education(PGDE)	0	0
Bachelor of Education(B.Ed)	8	80
Master of Education(M.Ed)	1	10
Doctorate in Philosophy (Ph.D)	0	0
total	10	100

According to table 27, 10% of the secondary school mathematics teachers had professional training as teachers with Diploma in Education and postgraduate Diploma in Education while 60% and 20% were teachers who had professional qualification with Bachelor of Education and Master of Education respectively. None of the teachers had Doctorate of philosophy. This shows that majority of secondary school mathematics teachers in Kathonzweni district are professionals.

Mathematics teachers were further asked to state their terms of employment. The table below displays the responses obtained.

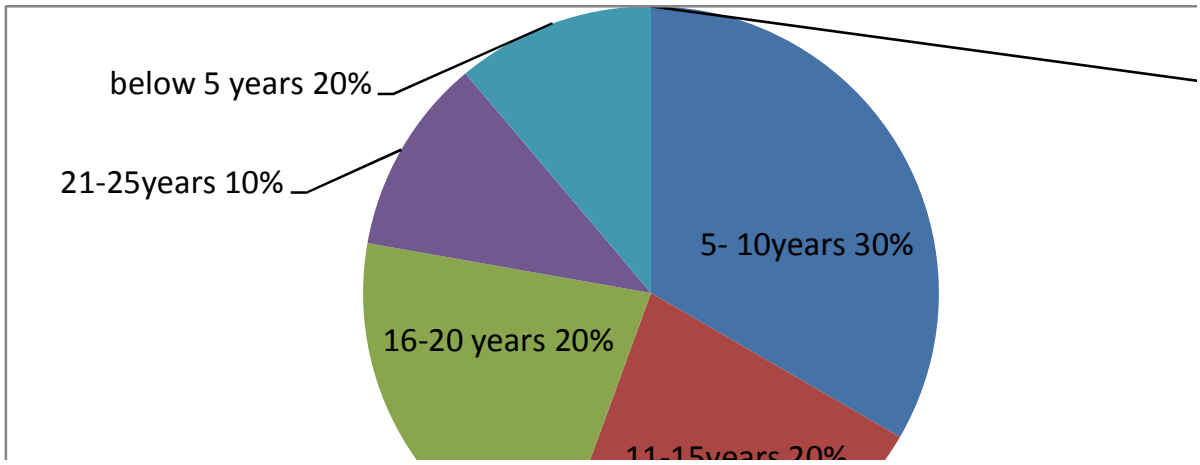
Table 28: Terms of employment

	frequency	percentage
Part time	1	10
Permanent	7	70
Volunteer	0	0
Self help	2	20
total	10	100

Table 28 indicated that majority of the respondents (70%) are permanently employed. One teacher was part time which was equivalent to 10%. Self help mathematics teachers constituted 20% while none was a volunteer teacher as this is represented by 0%. This shows that most of the teachers in Kathonzweni district are permanently employed.

The study also sought to find out secondary school mathematics teachers teaching experience. To achieve this, mathematics teachers were asked to state the number of years they have served as teachers.

Figure 13: Lengthy of teaching experience of mathematics teachers



According to figure 3, majority of the respondents (30%) have a teaching experience of between 5 ï 10 years, 20% have a teaching experience of between 11-15 years, the same applies to those teachers with teaching experience of between 16-20 years while those with teaching experience between 21-25 years and below 5 years are represented by 10%. None of the teachers had a teaching experience of above 25 years as this is represented by 0%. This data shows that majority of the mathematics teachers have a very little experience of teaching mathematics thus affecting studentsô performance.

The study further sought to establish what the duration mathematics teachers have taught in their current secondary schools. The responses obtained were tabulated in table 29.

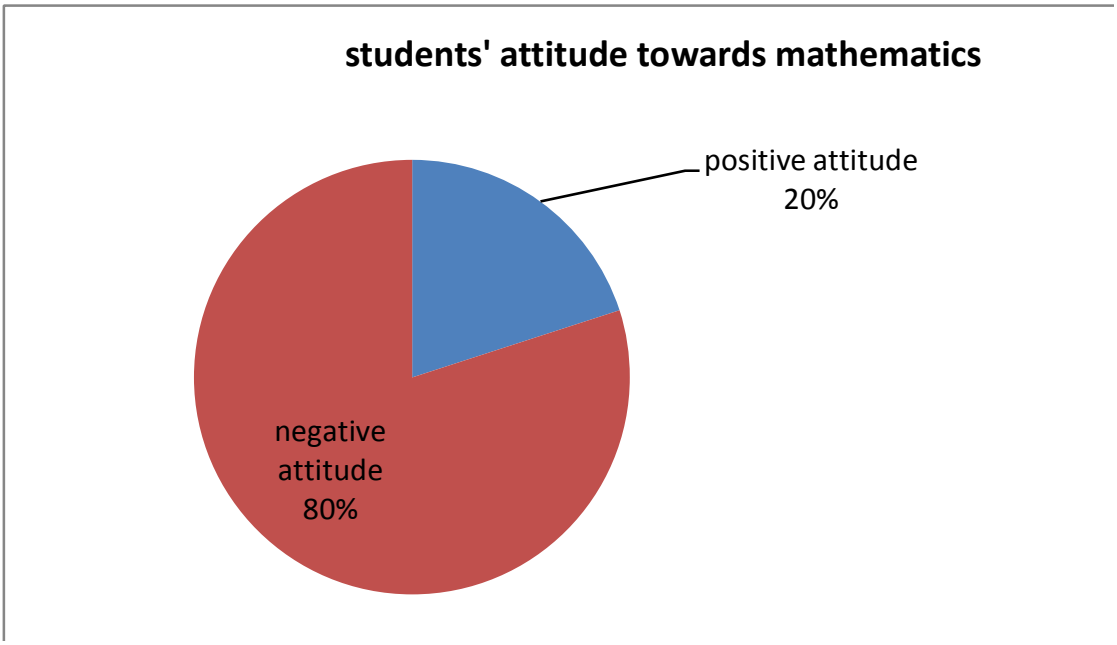
Table 29: The duration mathematics teachers have taught in their current schools

	frequency	percentage
Below 5 years	7	70
5-10 years	2	20
11-15 years	1	10
16-20 years	0	0
Above 20 years	0	0
total	10	100

Table 29 indicates that majority of mathematics teachers (70%) have been in their current school for less than 5 years while between 5 ï 10 years are represented by 20% and between 11-15 years are represented by 10%. None of the mathematics teachers has been in the current school for over 16 years. This could be an indication that mathematics teachers do not stay for long in one school and this may be affecting the studentsô performance.

The study sought to investigate the teachersô opinion over studentsô attitude towards mathematics. The question was whether their students have either positive attitude or negative attitude towards mathematics. The responses obtained were as displayed in figure 14.

Figure 14. Students' attitude towards mathematics



According to figure 14, majority of the secondary school mathematics teachers (80%) were of the opinion that their students have a negative attitude towards mathematics. Just a slight minority (20% of the respondents) who expressed a positive opinion of their studentsô attitude towards mathematics. The reason for the answer was the assumption that mathematics is difficult.

Mathematics teachers were also asked to rate their students mathematics performance in the KCSE. Table 30 shows the responses obtained.

Table 30. Rating of the students' mathematics performance in KCSE

	Frequency	percentage
Excellent	0	0
Very good	0	0
Good	2	20
Fairly good	5	50
Fair	3	30
Poor	0	0
total	10	100

Table 30 shows that majority of the respondents (50%) were of the opinion that their students performed fairly good in mathematics, while good and fair performance were represented by 20% and 30% respectively. None of the students would be rated excellent or very good. The reasons given were that mathematics is stressful and difficult to handle its concepts.

They were further asked also to state the methods they use when teaching mathematics and they stated the following: Demonstration using models, discussion groups and teaching aids. This is tabulated in table 31 below

Table 31: Methods used to teach mathematics

Methods used	frequency	percentage
Demonstrations using models	5	50%
Discussion groups	3	30%
Teaching aids	2	20%
total	10	100

Table 31 above illustrates that 5 mathematics teachers used demonstrations using models which constituted 50%. Discussion groups and teaching aids methods of teaching mathematics were represented by 30% and 20% respectively. This shows that most of the teachers used demonstrations using models.

The respondents were also asked to give suggestions so as to improve studentsô performance in mathematics in the KCSE. The suggestions they gave were as follows: changing attitude of learners from negative to positive, testing learners frequently, taking learners to symposiums, mathematics contest, thorough revision by learners and early completion of syllabus.

Table 32: Mathematics teachers' suggestions to improve mathematics

suggestions	Frequency	Percentage
Changing learnersô attitude from negative to positive	4	40%
Testing learners frequently	2	20%
Taking learners to symposiums	1	10%
Taking learners to mathematics contests	1	10%
Thorough revision by learners	1	10%
Syllabus coverage in time	1	10%
total	10	100

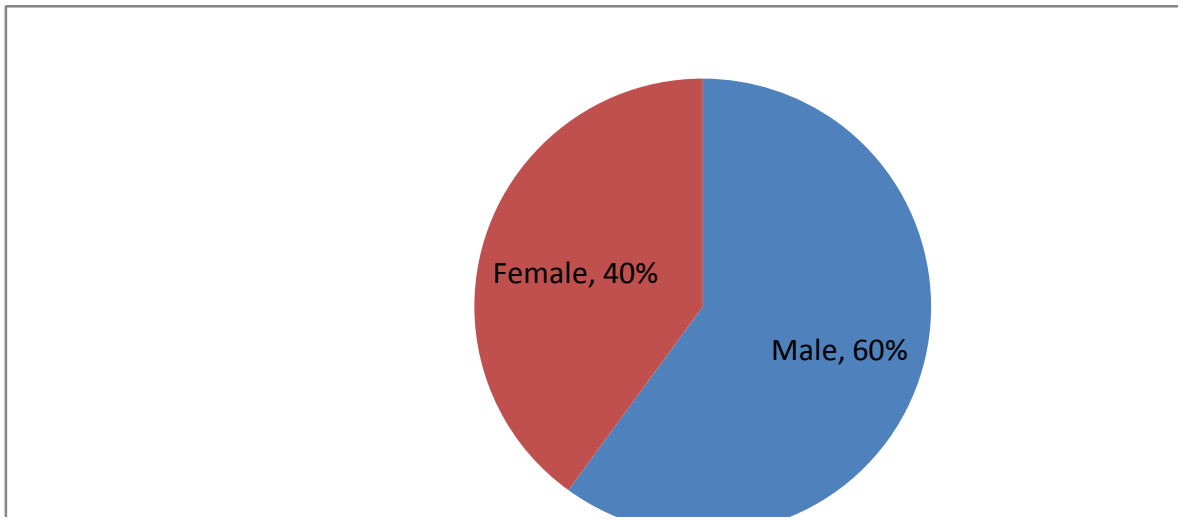
According to table 32, most of the teachers suggested the change of studentsô attitude towards mathematics. This was represented by 40%. Testing learners frequently constituted 20% while the other suggestion such as taking learners to symposium, taking learners to mathematics contest, thorough revision by learners and syllabus coverage were each represented by 10%. This shows that most of the teachers suggested changing of the learnersô attitude towards mathematics as an important suggestion.

4.6 Principals' response

4.6.1Principals' demographic information

On demographic information of principalsô, they were requested to state their gender. Figure 15 below shows the responses obtained.

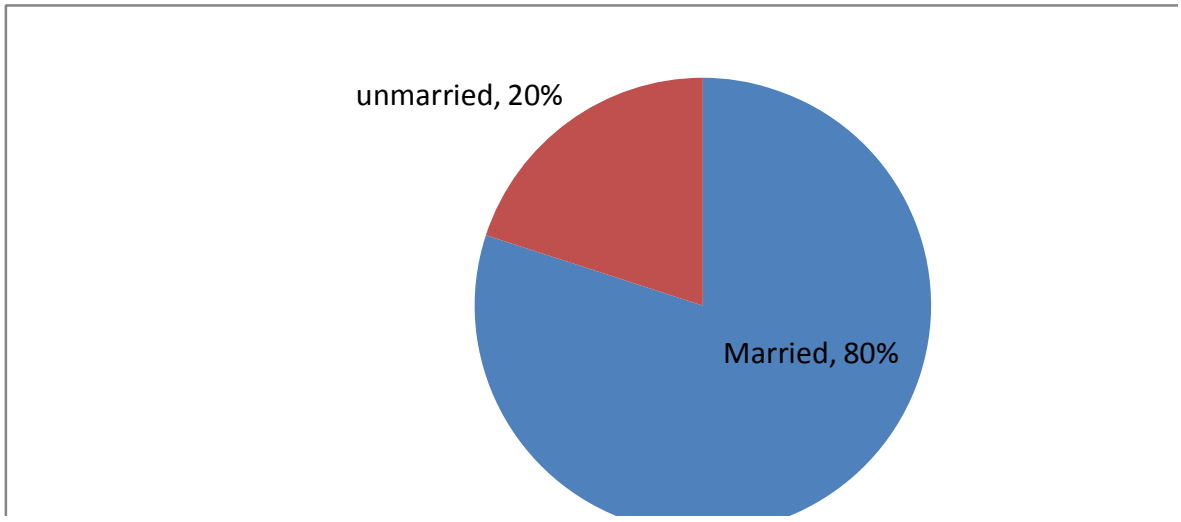
Figure 15: Gender distribution of secondary school principals



According to figure 15, majority of secondary school principals in Kathonzweni district are males as this was represented by 60% while female principals constituted 30%. There was need to find out why male principals were more in number compared to the female counter parts. Gender equality should be encouraged in all sectors of development inclusive of intellectual development.

The respondents were further asked to state their marital status. Figure 16 illustrates their findings of the study.

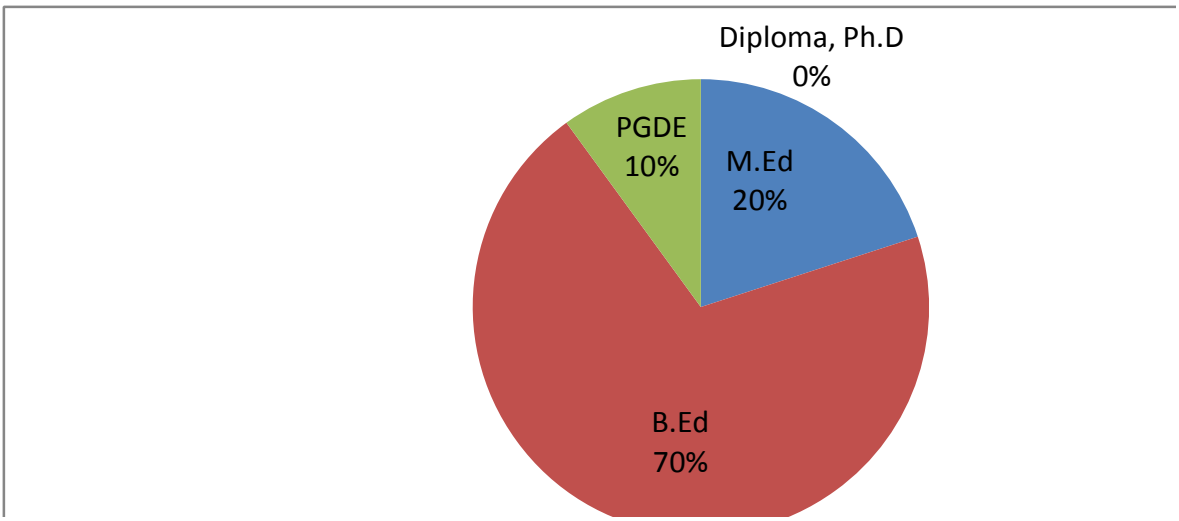
Figure 16: Marital status of secondary school principals



According to figure 16 majority of the secondary school principals in Kathonzweni district are married as this is constituted by 80% while a slight minority of the secondary school principals in this district are unmarried (single).

The researcher further wanted to determine the level of principalsô professional qualification as teachers. They were requested to state their highest level of training. Figure 17 summarizes the findings obtained.

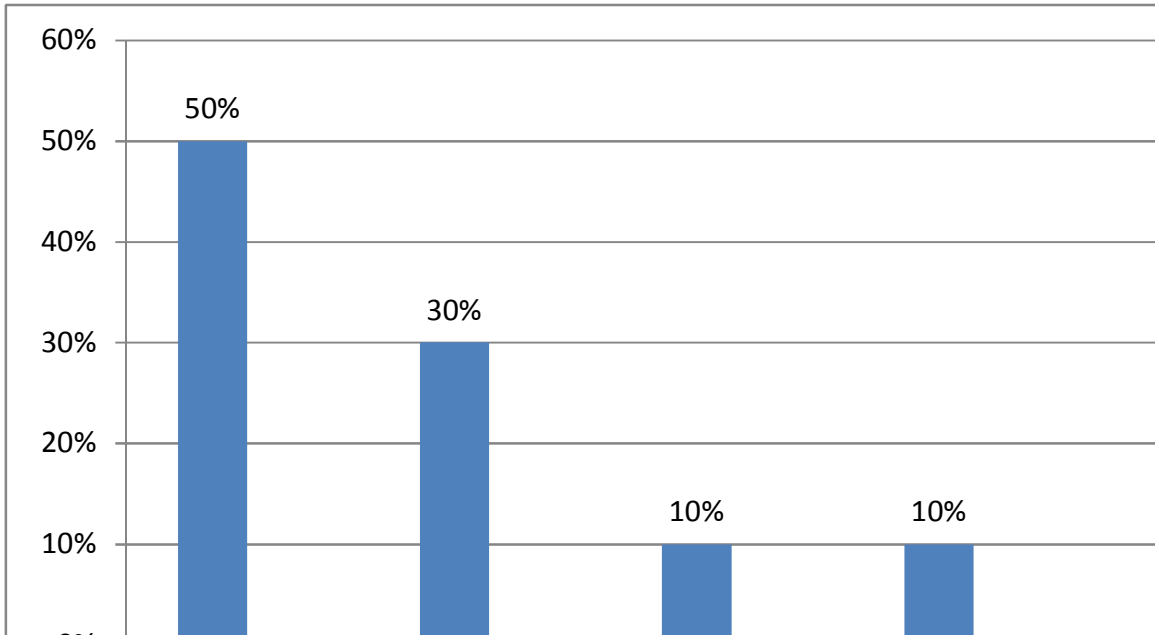
Figure 17. Principals' professional qualification



According to figure 17, majority of the respondents (70%) are professionally qualified as teachers with Bachelor of Education (B.Ed.) Those with Master of Education (M.Ed) and postgraduate Diploma in Education are represented by 20% and 10% respectively. None of them is a holder of Ph.D as this is represented by 0%. This shows that majority of secondary school principals are professionally qualified as teachers in Kathonzweni district.

Further the researcher sought to determine the duration they have worked as principals. Figure 18 below shows the responses obtained.

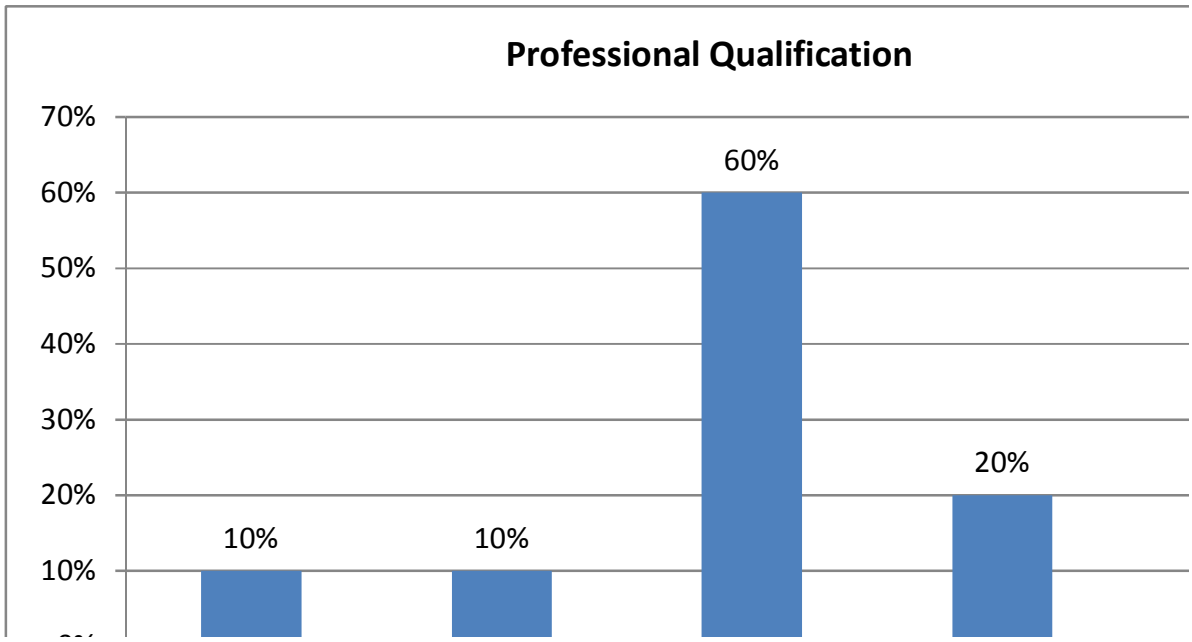
Figure 18: Duration the respondents have worked as principals



The findings in figure 18 indicated that a slight majority of the principals have been in their current schools for less than five years. This is represented by 50%. Between 5- 10 and 11 ï 15 years is represented by 30% and 10% respectively as well as another 10% representing duration between 16-20 years. None of them has worked in the current secondary school for over 21 years hence affecting studentsô performance.

The respondents were also asked to state the level of their mathematics teachersô professional qualifications in Forms 2,3 and 4. Figure 19 shows summary of the responses obtained.

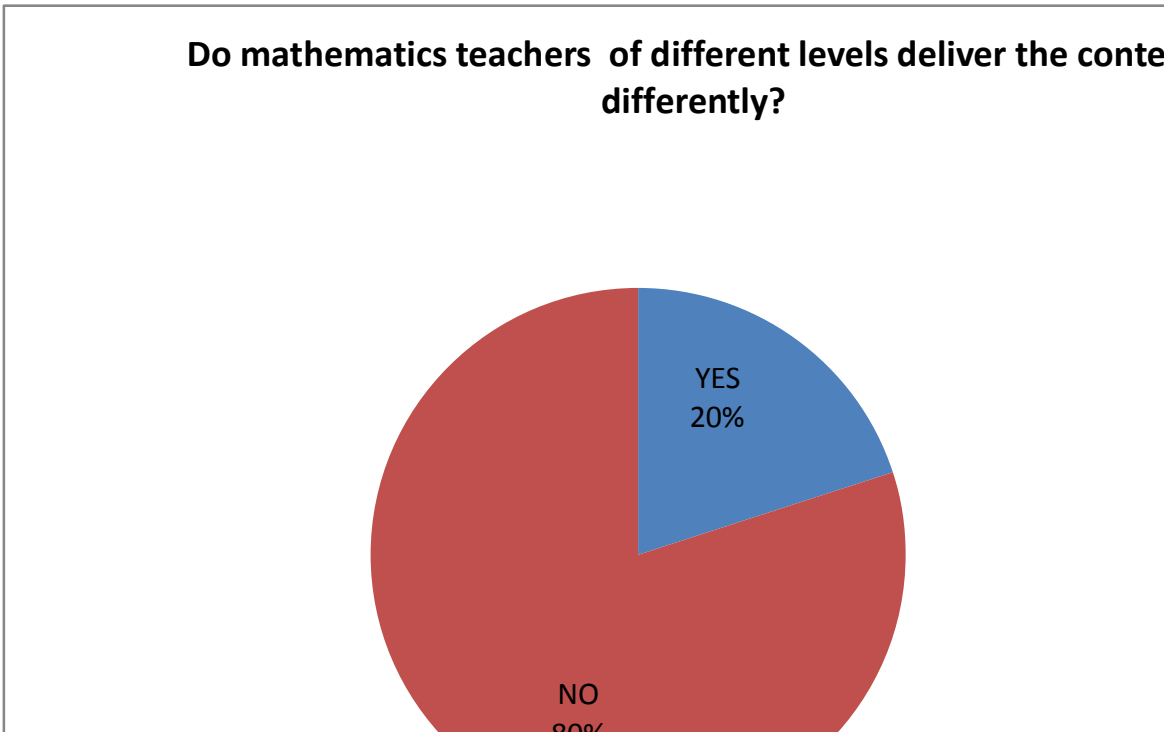
Figure 19: Mathematics teachers' Professional qualification according to their principals



According to Figure 19, majority of mathematics teachers in Forms 2, 3 and 4 are professionally qualified as teachers. This is represented by 60% of mathematics teachers with B.Ed while diploma and postgraduate mathematics teachers are represented by 10% each level. Teachers with Master of Education degree are represented by 20%. This shows that most of mathematics teachers are professionals. The principalsô response matches with what the teachers had indicated.

The principals were asked to state whether their mathematics teachers deliver the content differently. The findings obtained were as indicated in figure 20 below.

Figure20 : How mathematics teachers deliver the content



According to figure 20, majority of mathematics teachers do not deliver the content differently. The reasons given to such responses were as follows: They use the same course books, same teaching aids; same syllabus and they normally meet and exchange ideas. This is tabulated in table 33 below.

Table 33: Reasons of not delivering the content differently

Reasons	Frequency	percentage
Use of same course books	2	40%
Teaching aids	1	20%
Same syllabus	2	40%
Exchanging ideas	0	0
total	5	100%

In table 33, most of the mathematics teachers use the same course books and the same syllabus as this is represented by 40%. Teaching aids is represented by 20% while none of them gave the reason of exchanging ideas. This shows that mathematics teachers do not deliver the content differently.

The respondents were asked to state the girlsô performance in the KCSE. The responses obtained were as shown in the figure 21 below.

Figure 21: Girls' performance in KCSE

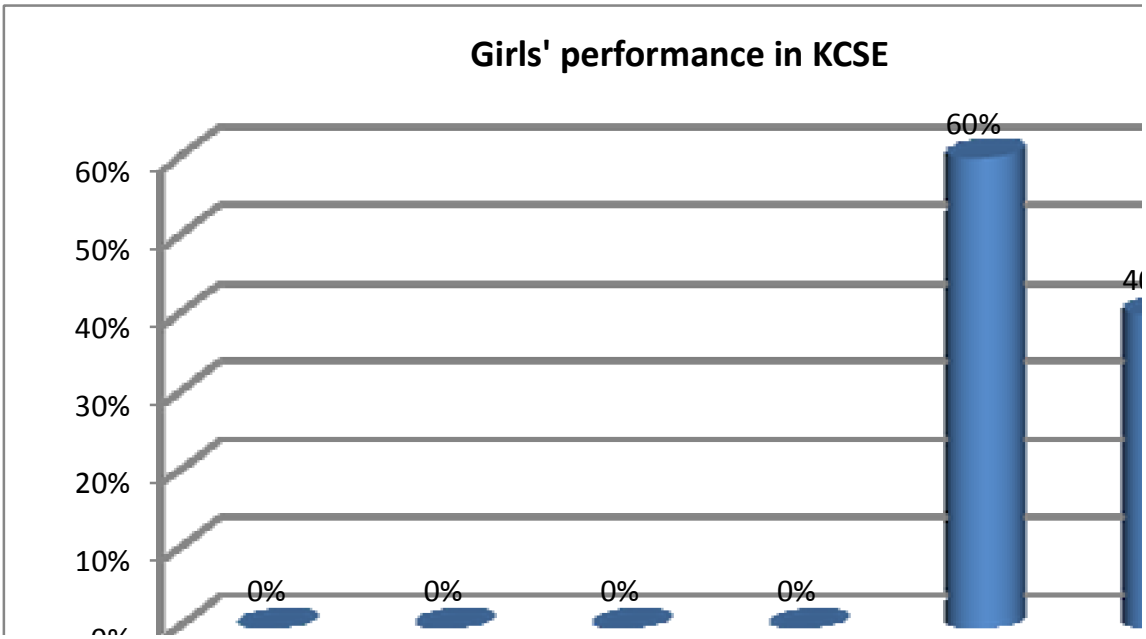
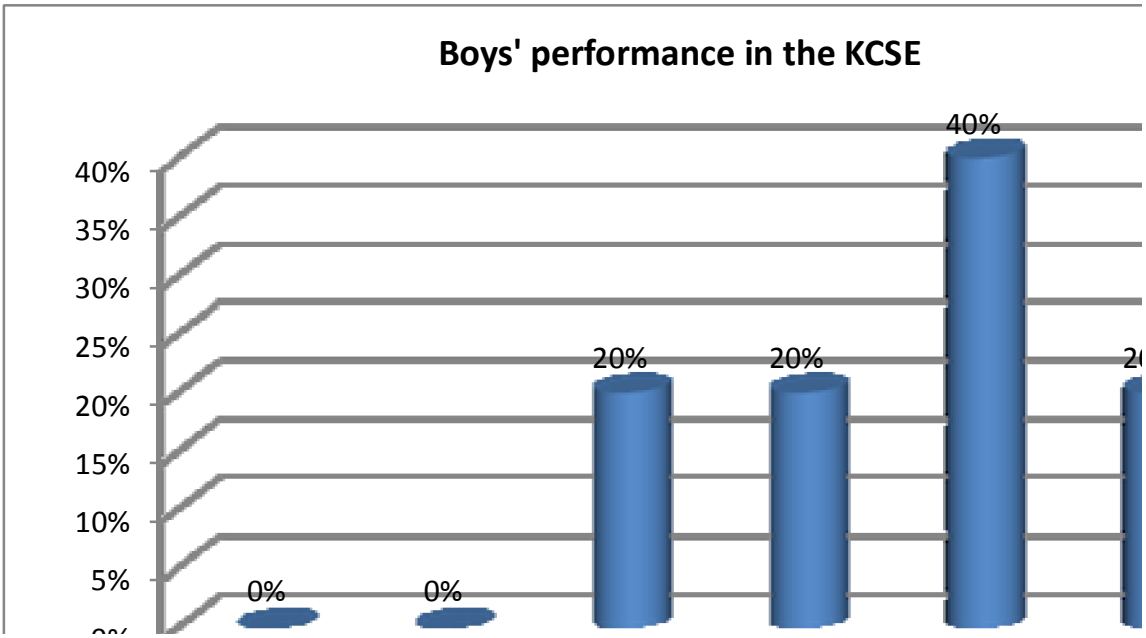


Figure 21 shows that girls have a fair performance in mathematics in the KCSE as this is represented by a high percentage of 60%. Poor performance is represented by 40% while none of the students performs excellently, very good or fairly good. This supports the opinion that girls do not do better in mathematics.

The principals were also asked to state the boysô performance in the KCSE and the findings obtained are displayed in figure 10.

Figure 22: Boys' performance in KCSE



The results as indicated in figure 22 showed that majority of the boys (40%) performed fairly while those in the level of good, fairly good and poor are represented by 20%. None of the boysô was rated excellent and very good performance as this is represented by 0%. This supports the idea of having a negative attitude towards mathematics.

Further the researcher sought to determine the general studentsô performance in mathematics in the KCSE and the findings obtained are indicated in figure 23 below.

Figure 23: General performance of students in the KCSE

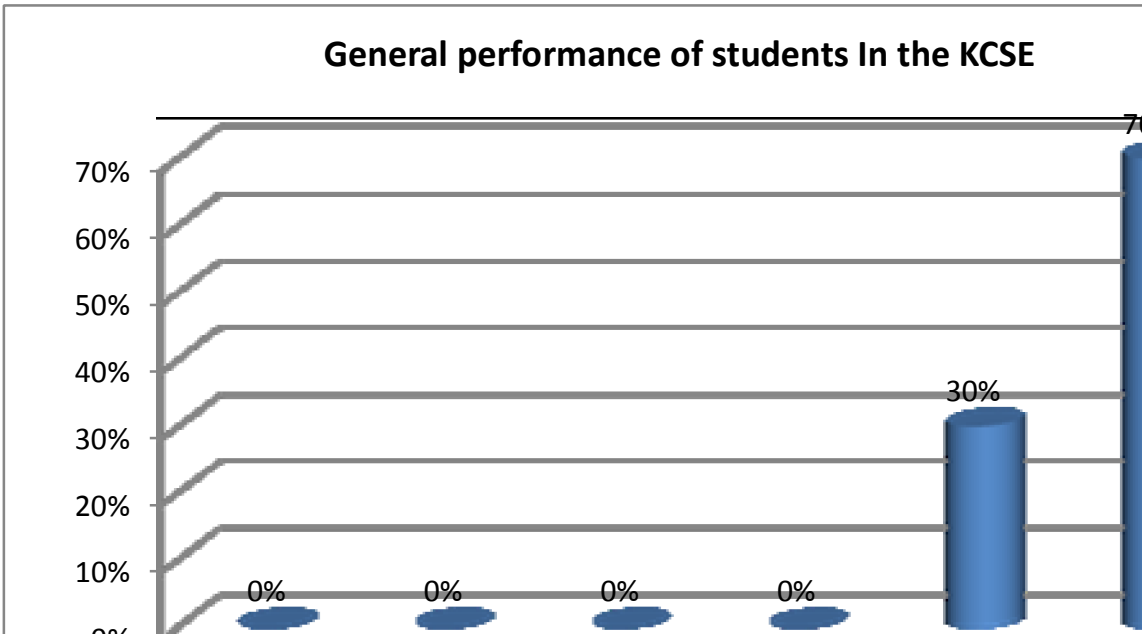


Figure 23 indicated that the studentsô general performance was poor as this was represented by 70%which is the highest percentage while fair performance of student is represented by 30%. The rest of performance by students is represented by 0% i.e Excellent, Very good, Good and fairly good. None of the students belonged to this level of performance.

The respondents were asked about the reasons leading to general studentsô performance . The table below shows the responses obtained.

Table 34: Reasons for general students' performance

Reasons given by principals	Frequency	percentage
Inadequate staffing	2	40%
Shortage of teaching materials	2	40%
Shortage of learning aids	1	20%
total	5	100

According to table 34, inadequate staffing was given as a reason by 40% of the principals. Shortage of teaching materials was represented by 40% while shortage of learning aids constituted 20%. This shows that for learners to perform well in mathematics there has to be adequate staffing, provision of teaching materials as well provision of learning aids.

The respondents were also requested to state their studentsô attitude towards mathematics. The responses obtained are displayed in figure 24.

Figure 24: Students' attitude towards mathematics

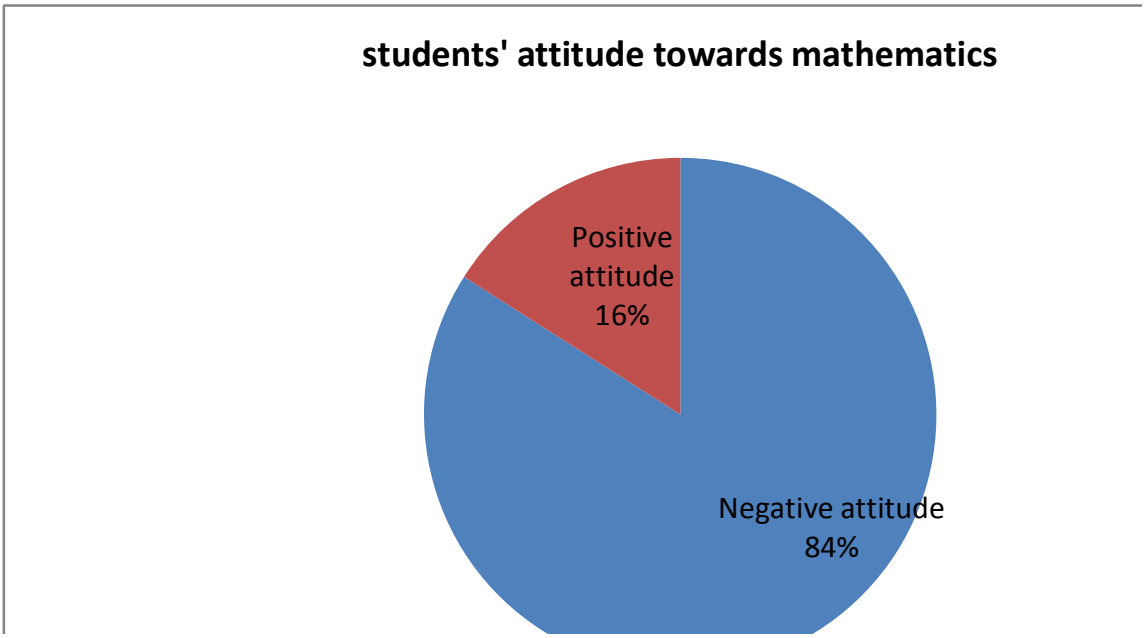


Figure 24 summarizes the findings of principals as pertaining the attitude of their students towards mathematics. Cumulatively, majority of the respondents (84%) were of the opinion that students have a negative attitude towards mathematics while a slight minority of 16% have a positive attitude towards mathematics. This affects studentsô performance in mathematics.

Principalsô were asked to give suggestions concerning professional qualification of mathematics teachers to improve studentsô performance in mathematics. The table below shows the responses of their findings.

Table 35: Suggestions concerning professional qualifications of mathematics teachers to improve students' performance in mathematics.

Principals' suggestion	**frequency**	**percentage**
Regular in-service courses	5	100%
Manageable workload	4	80%
Putting theory into practice	4	80%

According to table 35, those principals who suggested regular in-service were 5 which was equivalent to 100%. This implies that all the principals suggested regular in-service courses for mathematics teachers. Those who suggested manageable workload were 4 principals and this is represented by 80% of all the principals. Putting theory into practice was represented by 80% which is equivalent to 4 principals.

The principals were also asked to give suggestions concerning studentsô attitude towards mathematics to improve their performance in mathematics. They suggested that their students should improve or change their attitude towards mathematics as a subject taught and examined in secondary schools. They also suggested that the students need to be used in exercise/practice. This is tabulated in table 36 below.

Table 36: Principals' suggestions on improving students' performance as a way of changing students' attitude towards mathematics

Principalsô suggestions	frequency	percentage
Change of studentsô attitude towards mathematics	5	100%
Studentsô need to be used in exercise/practice	5	100%

According to table 36, all the five principals suggested that there should be change of studentsô attitude towards mathematics and studentsô need to be used in exercise/practice. The response constituted 100%.

The principals were also asked to give their suggestion concerning teaching experience of their mathematics teachers. The table below shows the responses obtained.

Table 37: Principals suggestion to improve students' performance in mathematics concerning teaching experience of their teachers

Principalsô suggestions	frequency	percentage
Need of manageable workload	5	100%
Purchase of supplementary teaching aids for practice purpose	5	100%

According to table 37, all the principals suggested that mathematics teachers need manageable workload and learners should purchase supplementary teaching aids for practice purpose. All these are represented by 100%.

Further on principalsô suggestions, they were requested to give suggestions concerning gender disparity of secondary school mathematics teachers. The table below shows their responses.

Table 38: Principals' suggestions on gender disparity of secondary school mathematics teachers on students' performance in mathematics.

Principals ôsuggestion	Frequency	Percentage
Preference of female mathematics teachers to male mathematics teachers	3	60%
Preference of male mathematics teachers to female mathematics teachers	4	80%

According to table 38, most principals seemed to prefer male mathematics teachers to female mathematic teachers. This is represented by 80% while a slight minority of secondary school principals in Kathonzweni district prefer female mathematics teachers to male mathematics teachers. This is constituted by 60%.

As pertaining improvement of studentsô performance in mathematics, the respondents were asked to suggest ways of improving mathematics in KCSE. The table below shows the responses of the study.

Table 39: Principals' suggestions of improving students' mathematics performance in KCSE

Principalsôsuggestion	frequency	Percentage
Employment of many teachers by government	5	100%
Funding capacity building programmes	5	100%
Improving teaching/learning aids	5	100
Peer teaching/discussion groups	5	100
Use of learning /teaching aids	5	100
Mathematics contest / symposiums	5	100%
Integrating mathematics in various life examples	5	100%
Difficulty topics to be identified by mathematics teachers	5	100%
Teacher guided revision	5	100%
Interest cultivation on studentsôperformance	4	80%

According to table 39, respondents suggested that there should be employment of many teachers by government, funding capacity building programmes as well as supply of teaching/learning aids. Peer teaching, use of teaching aids, mathematics contest, integrating mathematics in various life examples like population, settlement environment and use of symposia both internally and externally. These were the suggestions of all principals as each is represented by 100% with an exception of the suggestion of mathematics teachers identify difficult topics which is represented by 80%.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents summary of the findings of the study in relation to the objectives outlined in chapter one. It also makes presentation of the conclusion of the study together with the recommendations that involved the assessment of the factors influencing studentsô performance in mathematics in the Kenya Certificate of Secondary Education.

5.1 Summary of the study

The purpose of the study was to survey on the factors influencing studentsô performance in mathematics in the KCSE examination in Kathonzweni district in Makueni County. The factors under study comprised of students attitude towards mathematics, professional qualification of mathematics teachers in studentsô performance, mathematics teachersô teaching experience of studentsô performance in mathematics, mathematics teachersô gender in studentsô performance and studentsô career aspirations of studentsô performance in mathematics. These variables were analyzed against KCSE examination in mathematics for the period 2006 to 2010. The literature reviewed all these and a conceptual framework was developed to guide the study.

Data was collected using questionnaires which were administered to various respondents. The samples included two hundred students, ten mathematics teachers and five principals in the selected five secondary schools in Kathonzweni district. However, only one hundred and sixty one students, ten mathematics teachers and five principals responded representing a return rate of 80.3%. Data collected was analyzed quantitatively and the findings of the study indicated that these factors influence studentsô performance in mathematics in the KCSE examination as identified by the respondents.

As pertaining to the findings in relation to each objective question, the researcher therefore found that:

1. There was significant relationship between studentsô attitude towards mathematics and their performance in the Kenya Certificate of Secondary Education (KCSE) examination.

2. There was no significant relationship between mathematics teachersô professional qualifications and the studentsô performance in mathematics in Kenya Certificate of Secondary Education (KCSE) examination.
3. There was no significant relationship between the teaching experience of mathematics teachers and students performance in mathematics in the (KCSE) examination.
4. There was significant relationship between mathematics teachers gender disparity in students performance in the (KCSE) examination.
5. There was significant relationship between the students career aspirations and students performance in the (KCSE) examination.

5.2 Conclusion

This study investigated factors influencing studentsô academic performance in mathematics in secondary schools in Kathonzweni district. The conclusions are made within the framework of the limitations of the study as noted in chapter one. The findings of this study indicated that studentsô performance in mathematics at Kenya Certificate of Secondary Education (KCSE) is below average with most candidates scoring grades D and E.

All mathematics teachers were professionally qualified and yet their students continued to score miserable grades in mathematics in the (KCSE) examination. Most of the students scored grade E or D. Three out of five schools visited had average grade of E for the period 2006 and 2010. Other two schools had average grades of D plus. None of the five schools had registered a grade better than D plus in any of the five years under study. Even the one teacher with masterôs degree was in schools that had grade E average for the last five years. The causes of such performance in mathematics in the area under study could not be attributed to teacher related factors of professional qualification and mathematics teachers teaching experience. These variables were tested and found to have no significance relationship of students in the KCSE mathematics examination.

On the basis of this research, it was therefore worth noting that the studentsô performance in mathematics could be attributed to other factors other than teacher related factors. It had been

found out by mathematics teachers that, such a performance in mathematics was due to negative attitude among students towards mathematics, mathematics teachersô gender disparity and studentsôcareer aspirations on studentsômathematics performance.

5.3 Recommendations

Such performance of mathematics is a serious and persistent problem among schools in Kathonzweni district. For performance improvement, the teachersô suggestions form the basis on which the following recommendations are made: To improve studentsô performance in mathematics on students, there should be peer teaching among students themselves, teachers should use teaching aids, mathematics contest should be organized between schools, mathematics teachers should be given opportunities to attend strengthening of mathematics, sciences in secondary school (SMASSE) workshops as well as organizing Activity, Students-centered Experience and Improvisation(ASEI) and Plan, Do, See and Improve(PDSI) seminars/workshops etc.

To change the negative attitude towards mathematics, held by the students, proper guidance and counseling on the subject should be given. Role model and speakers should be invited to schools to talk to the students on the importance of mathematics. There should be positive reinforcement and incentives for students who show improvement on mathematics. However mathematics teachers should also motivate their students by having positive teaching and making positive comments even when performance is not very good. They should not make statements that make students lose hope and feel inadequate. Mathematics teachers should go for regular courses, workshops and seminars on mathematics. This could help teachers come up with better teaching methodology, approaches and strategies for effective teaching and learning of mathematics. Many teachers indicated that the primary school curriculum therefore needs revision. It should be tailored with such a way that the secondary school curriculum becomes only a continuation.

Further on that teacher, workload should be reduced as well as simplification of mathematics concept for easier understanding. More time should be allocated to mathematics or reduce

content in the syllabus. Seminars and refresher courses for mathematics teachers should be organized as well as provision of remedial lessons, making mathematics optional and formation of mathematics clubs in secondary schools.

Many secondary school mathematics teachers complain that mathematics taught in primary school has no meaning with that taught in form one. The researcher has established that mathematics is indeed a poorly performed subject. The researcher therefore recommends that this problem be addressed urgently. The ministry of education, science and technology (MOEST), Kenya institute of curriculum development (KICD), Kenya national examination council (KNEC) and all other interested parties (stakeholders) should seek ways of solving these persistent problems of poor mathematics performance.

Teachers should also cultivate interest to more studentsô use of teaching aids and other relevant examples, integrating mathematics in various life examples like population, settlement, environment, use of mathematics symposia internally and externally, mathematics contest, identifying difficult teaching, revision work which should be teacher guided on topic use. Mathematics teachers should also attend regular in-services courses, teachers to practice what they learned in the teaching process of training in the University and teacher training colleges. Besides this, they need to practice teaching methods that they acquired during their training in colleges/universities.

To improve on performance of mathematics, there should be improvement in staffing of mathematics teachers so that a teacher has manageable workload and hence be able to practice teaching methods properly. Finally teaching of mathematics should be adequate and efficient so as to improve performance of this subject.

5.4 Suggestions for further research

The findings of this study are limited to the specific variables studied on. However, the following areas related to mathematics performance have been recommended for further research.

1. The same study should be replicated on another geographical area. The sample could be drawn from other districts within Makueni County or a different district elsewhere in Kenya.
2. This study shows that poor performance in mathematics could be attributed to other factors which should be investigated, for example quality of education facilities and resources.
3. Only studentsô attitudes towards their performance in mathematics, professional qualifications of teachers on studentsô performance, mathematics teachersô teaching experience on studentsô performance, teachersô gender disparity on studentsô performance and studentsô career aspirations on studentsô performance are now the studied factors influencing studentsô performance in mathematics. The research can be broadened to include the instructional methods applied in teaching mathematics, quality of educational facilities and resources, secondary schools managements, etc.
4. Also the related study can be done on the objectivity of the Kenya Certificate of Secondary Education (KCSE) mathematics examiners in marking.
5. In addition to the above it would be important to identify teaching materials that would be appropriate in teaching mathematics.

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APPENDICES

APPENDIX 1

QUESTIONNAIRE FOR STUDENTS

This questionnaire is designed to assist me to find out the factors influencing performance of mathematics in the Kenya Certificate of secondary education (KCSE) in Kathonzweni district.

The information you provide will be used for research purpose only and will be treated with utmost confidentiality. Please do not write your name or that your school. Kindly, you are requested to respond to the items in this questionnaire as correctly and honestly as possible.

Please tick whichever you think is appropriate in the boxes provided.

Section A. Demographic information

1. What is your gender? Male ☐ female ☐
2. What is your age? Below 15 years ☐ 16 years ☐ 17 years ☐ 18 years ☐ above 19 years ☐
3. Which class do you belong to? Form 2 ☐ Form 3 ☐ Form 4 ☐
4. Have you ever repeated any class? Yes ☐ No ☐
5. How many are you in the family? Boys ☐ Girls ☐
6. Whom do you live with? Both parents ☐ Mother ☐ Relative ☐ Father ☐
7. How far is your home from school? Very far ☐ Far ☐ Not far ☐
8. What is the occupation of your parents/guardians? é é é é é é é é é é é é é ....

é é

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9. Please Indicate your parents / guardians level of education with a tick in the boxes provided.

	Primary level	Secondary level	Tertiary level	university	
father					
mother					
guardians					

Section B. Students' Attitude towards Mathematics

10. What percentage do you normally score in mathematics?.....

11. What do you expect to score in mathematics in the Kenya Certificate of Secondary Education KCSE? é ..

12. State your most favourite subjecté é é é é é é é é é é é é é é é é é ..

13. Do you find it easy to do with a colleague? Yes ☐ No ☐

14. Explain your reason é ..

15. In the table below please tick whichever you think is appropriate in the boxes provided.

Note. SA=strongly agree, A=agree, D= Disagree, SD=strongly disagree

No.		Strongly agree	agree	disagree	Strongly disagree
i	I like mathematics				
ii	Iôm always under strain when studying mathematics				
iii	I enjoy studying mathematics				
iv	Solving mathematics problems is stressful				
v	The more mention of mathematics irritates me				
vi	Mathematics makes me uncomfortable				
vii	When studying mathematics at times I feel lost				
viii	I have good feeling towards mathematics				
ix	Mathematics gives me a sense of security				

16. Suggest what you would like to do to improve the teaching of mathematics.....

.....

.....

Section C: Professionalism of Mathematics Teachers

17. In the table below rate by ticking the statement on teachersô capability in teaching mathematics.

Note: **SA-strongly agree, A-agree, D- disagree, SD - Strongly disagree**

No	**Teachers' professionalism**	**Strongly agree**	**agree**	**disagree**	**Strongly disagree**
i	My mathematics teacher is competent				
ii	He or she explains concepts well				
iii	He or she marks our assignment books				

iv	He or she completes the syllabus in time				
vi	He or she revises with us in class				

18 (i). Do you think there is a difference between the teaching of mathematics by male and female teachers? Yes ☐ No ☐

(ii)please explain your answer.....

.....

.....

.....

Section D: Students' Career Aspirations:- This Section Seeks Information on Students Performance in Mathematics as a subject Examined in the Kenya Certificate of Secondary Education (KCSE)

19. Please tick whichever you think is appropriate in the boxes provided

Note. SA=strongly agree, A= Agree, D=Disagree, SD= Strongly disagree

no		Strongly agree	agree	disagree	Strongly disagree
i	I would like to do mathematics in university or any college after secondary school				
ii	I would like to become a secondary school mathematics teacher				
iii	I would like to do a course related to mathematics.				

Thank you

APPENDIX 2

Mathematics Teachers Questionnaire

This questionnaire is designed to assist me to find out the factors influencing performance of mathematics in the Kenya Certificate of Secondary Education (KCSE) in Kathonzweni district. The information you provide will be used for research purpose only and will be treated with utmost confidentiality. Please do not write your name or that of your school. Kindly respond to all the items in the questionnaire as correctly and honestly as possible.

Please tick whichever you think is appropriate in the boxes provided

SECTION A: Background Information

1.What is your gender ? Male ☐ Female ☐

2.What is your age? Below 25 years ☐ 26-30 years ☐ 31-35 years ☐ 36-40 years ☐

41-45years ☐ 46-50 years ☐ 51 and above ☐

3. What is your marital status? Single ☐ Married ☐

4. Indicate your professional qualification Diploma ☐ PGDE ☐

B. ED ☐ M. ED ☐ PH.D ☐

5. What are the terms of employment? Part time ☐ Permanent ☐

Volunteer ☐ Self- help ☐

6. .Please indicate how long you have taught in your present school

Less than 5 years ☐ 6-10 years ☐ 11-15years ☐

16-20 years ☐ above 20 years ☐

Section B: Factors Influencing Performance of Mathematics in the Kenya Certificate of Secondary Education (KCSE)

Please tick whichever you think is appropriate in the boxes provided

7.What is your teaching experience? Below 5 years ☐ 5-10 years ☐

11-15years ☐ 16-20 years ☐ 21-25 years ☐ above 25 years ☐

8. What is the attitude of your students towards mathematics?

Positive ☐ Negative ☐

9.Please explain the reason for your answer.....

.....

10. How would you rate your studentsô mathematics performance in the Kenya Certificate of Secondary Education (KCSE)?

a) Excellent very good Good fairly good

b) Please explain the reason for your answeré é
é ..

11.What are some of the methods you use when teaching mathematics?..
é é

12.Suggest ways of improving mathematics performance in the Kenya Certificate of Secondary Education (KCSE)é é

Thank you for your participation in the study

APPENDIX 3

Principals Questionnaire

This questionnaire is designed to assist me to find out the factors influencing performance of mathematics in the Kenya Certificate of Secondary Education (KCSE) in Kathonzweni district. The information you provide will be used for research purpose only and will be treated with utmost confidentiality. Please do not write your name or that of your school. Kindly respond to all the items in the questionnaire as correctly and honestly as possible.

Please tick whichever you think is appropriate in the boxes provided

SECTION A. **DEMOGRAPHC INFORMATION**

1. What is your gender? Male ☐ Female ☐

2. What is your marital status? Single ☐ Married ☐

3. What is the level of your professional qualification? Diploma ☐
   PGDE☐ B.ED ☐ M. ED☐ PH.D☐

4. How many years have you worked as a principal? Below 5 years ☐
   5-10 years ☐ 11-15 years ☐ 16-20 years ☐ 21-25 years ☐ above 25 years ☐

5. How long have you been in your current school? Below 5 years ☐
   5-10 years ☐ 11-15 years ☐ 16-20 years ☐ 21-25 years ☐ above 25 years ☐

Section B: Factors Influencing Performance of Mathematics in the Kenya Certificate of Secondary Education (KCSE)

6.What is the level of professional qualification of your mathematics teachers in Form 2, 3 and 4? SI ☐ Diploma ☐ Advance Diploma ☐ B.ED ☐ M. ED☐ PH.D☐
Any other ☐

7.(a) Do mathematics teachers of different levels deliver the content differently?
Yes ☐ No ☐

(b) Explain your answeré .
é é

8. How is the Girlsô performance of mathematics in the Kenya Certificate of Secondary Education (KCSE) Excellent ☐very good ☐ good ☐ fairly good ☐
Fair ☐ poor ☐

9. How is the Boysô performance of mathematics in the Kenya Certificate of Secondary Education KCSE? Excellent ☐very good ☐good ☐ fairly good ☐

Fair ☐ poor ☐

10. (a) How is the performance of mathematics in the Kenya Certificate of Secondary School (KCSE) generally? Excellent ☐ very good ☐ good ☐ fairly good ☐

Fair ☐ poor ☐

(b) give reasons for your answeré .

é é

11.What is your studentsô attitude towards mathematics in your school?

Positive ☐ Negative ☐

Section C: Suggestion of Implementation of Improving Performance in the Kenya Certificate of Secondary Education (KCSE)

12. What suggestions can you give concerning studentsô attitude towards mathematics?

é ....

....

13. What suggestion do you have concerning professional qualification of teachers?

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é é

14. What suggestion can you give concerning teaching experience of mathematics teachers?

é é

é é

15.What suggestion do you have concerning gender disparity of secondary school students performance of mathematics in the Kenya Certificate of Secondary Education (KCSE)?...

....

16. What suggestions do you have on improving mathematics in the Kenya Certificate of Secondary Education(KCSE)?

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é ..

Thank you for your cooperation!! God Bless You!

APPENDIX 4: WORK PLAN

Time activity	May 2013	June	July	Aug.	Sept	Oct	Nov	Dec
Identification and presentation of research problem								
Gathering of related literature								
Proposal Writing and Compiling								
Submission of the Proposal								
Data Collection/analysis								
Project Writing and Compiling/presentation								

APPENDIX 5: BUDGET

Activity	Quantity	Cost	
Stationary	5 reams of printing papers	500	Kshs. 2500
Data collection analysis			Kshs. 10000
Proposal writing and compiling	7 copies (50 pages)	50 per page	Kshs. 17500
Transport			Kshs. 25000
Final copy research typing and printing	7 copies(50pages)	50 per page	Kshs. 17500
Pilot			Kshs. 5000
Sub total			Kshs. 77500
Miscellaneous			Kshs. 7750
Research Project Permit	1 copy		Kshs. 1000
Total cost	10% of total amount		Kshs. 86250

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

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Our Ref: **NCST/RCD/14/013/933**

Date: **4th June 2013**

Patrick Makau Sila
University of Nairobi
P.O Box 92-0902
Kikuyu.

RE: RESEARCH AUTHORIZATION

Following your application dated **28th May, 2013** for authority to carry out research on "***Factors that influence performance of mathematics in the Kenya Certificate of secondary Education (KCSE): A case of Kathonzweni District in Makueni County, Kenya.***" I am pleased to inform you that you have been authorized to undertake research in **Kathonzweni District** for a period ending **5th September, 2013.**

You are advised to report to **the District Commissioner and District Education Officer, Kathonzweni District** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:
The District Commissioner
The District Education Officer
Kathonzweni District.