FACTORS CONTRIBUTING TO PUPILS' POOR PERFORMANCE IN MATHEMATICS AT KCPE IN PUBLIC PRIMARY SCHOOLS IN ISIOLO DISTRICT EASTERN PROVINCE, KENYA.

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E54/0054/03

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AUG 2005
DECLARATION

This is my original work and has not been presented for any other study programmes in any other university.

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25/8/05

This Project has been submitted with my approval as the University Supervisor.

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DATE
August 25, 2005
DEDICATION

This project is dedicated to my mum, Mrs. Teresia M. Benson and my late father, Mr. Benson M’Ringera without whom I would not have been a unique person to engage in this Education Research.
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I am also grateful and wish to convey sincere gratitude to the head teachers of Elsa, Kilimani, Wabera, Goda, Bula Mpya and Isiolo Barracks Primary Schools, who permitted me to undertake the study in their schools and spared time to participate in it. The mathematics teachers and pupils of the above mentioned schools deserve my sincere thanks for participating in the study.

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The author would like to absolve all individuals and institutions mentioned above for any errors of omission and/or commission or any interpretational error(s) for these, the author remains solely responsible.
ABSTRACT

The central problem of the study was that, despite the fact that over 80% of the primary school children are in public primary schools in Kenya, these children do not perform well in mathematics at KCPE examination. The performance of mathematics at KCPE has been poor since independence. The study was to identify factors influencing students' poor performance in selected schools in Isiolo District.

The objectives of the study were to investigate the extent to which factors such as: nature and adequacy of resources and school facilities, syllabus coverage, teachers/pupil ratio, teachers and pupils' attitude towards mathematics and social cultural background of the learners, influenced students' performance in mathematics.

Six out of 46 KCPE public primary schools were purposefully sampled in Isiolo District. These schools were: Kilimani, Elsa, Wabera, Goda, Bula Mpya and Isiolo Barracks. The schools were selected on the basis of rural and urban, good and poor performing schools, high and low enrollments. The study involved 6 head teachers, 2 mathematic teachers and 20 pupils from each sample school, 3 AEOs and 24 opinion leaders. Pupils included in the study were those in classes 6, 7 and 8 because they were more mature and could respond to the questionnaires correctly. Out of the 20 pupils per sample school, 60% were boys while 40% were girls. The difference was because in ASAL districts few girls attend school. Pupils selected were those in age bracket of 8 - 12 years. The total sampling matrix was 165 respondents.

Data collection instruments comprised of questionnaires, interview schedules and observation guidelines. The developed instruments were piloted to determine their reliability and validity. Reliability of measurements concerned the degree to which a particular measuring procedure gives similar results over a number of repeated trials. Test retest method was used. Content validity referred to establishing whether the instruments could measure what they were intended to measure. This was done through inviting 5 expert mathematics teachers who participate in marking KNEC examinations, to look into the content of the instruments and then give feedback on the same.

Different methods were employed to gather information for the intended research. Data was collected using questionnaires, interview guides and observation guidelines. Questionnaires were presented to standard 7 and 8 pupils, teachers, head teachers and
AEOs. The opinion leaders were interviewed using structured interview guides. The researcher observed variables such as physical facilities, scholastic resources, class size and both pupils and teachers behaviour during the lesson. Classroom observation was done in order to judge teaching methodology and learners' attitude. The data collected was processed and analyzed using descriptive form. Tables, frequencies, graphs, charts and percentages were used to present the data.

The research findings revealed that, there were inadequate physical facilities and instructional materials such as classes, desks, teaching and learning resources. This did not enhance nor facilitate teaching and learning process. There was inadequate syllabus coverage and even when covered, it was not effectively done by more than half of the schools. Pupils and teachers attitude towards mathematics was found to be negative due to various factors such as lack of motivation. Social cultural background of the learners was found to be discouraging as far as education was concerned. Culture does not allow counting of items especially livestock for fear of bewitching. This denied children basic skills of counting, additions and subtractions. It was found out that, teacher/ pupil ratio in about 67% of the public primary schools was within MOEST recommended ratio of 1:40. This was not found to be a contributing factor to poor performance in mathematics at KCPE.

The researcher made the following recommendations as per the study objectives. Education stakeholders at school level should solicit for funds to provide more classes, desks and teaching/ learning materials, which facilitate the process of teaching and learning. Teachers should strive to cover mathematics syllabus effectively and on time. All school aged children should be taken to school. Both parents and teachers should strive to cultivate positive attitude towards mathematics among learners by encouraging them. Teachers should be motivated by providing them with instructional materials and rewarding them when they perform well in mathematics. For social cultural background of the learners, parents should be educated on the importance of education and be encouraged to take their children to school. Parents should be made aware of the outdated cultural practices like female genital mutilation and early marriages for girls and instead, take them to school. The researcher recommends further research be conducted covering a wider scope and other possible factors which might be contributing to poor performance in mathematics.
## ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AEO</td>
<td>Area Education Officer</td>
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<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>ASAL</td>
<td>Arid and Semi-Arid Land</td>
</tr>
<tr>
<td>BER</td>
<td>Bureau of Education Research</td>
</tr>
<tr>
<td>CPE</td>
<td>Certificate of Primary Education</td>
</tr>
<tr>
<td>DEO</td>
<td>District Education Officer</td>
</tr>
<tr>
<td>FPE</td>
<td>Free Primary Education</td>
</tr>
<tr>
<td>GT</td>
<td>Gross Total</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>KCE</td>
<td>Kenya Certificate of Education</td>
</tr>
<tr>
<td>KNEC</td>
<td>Kenya National Examination Council.</td>
</tr>
<tr>
<td>KCPE</td>
<td>Kenya Certificate of Primary Education</td>
</tr>
<tr>
<td>KRT</td>
<td>Key Resource Teacher</td>
</tr>
<tr>
<td>MIS</td>
<td>Management Information System</td>
</tr>
<tr>
<td>MOEST</td>
<td>Ministry of Education Science and Technology</td>
</tr>
<tr>
<td>SMC</td>
<td>School Management Committee</td>
</tr>
<tr>
<td>ST</td>
<td>Subtotal</td>
</tr>
<tr>
<td>STD</td>
<td>Standard</td>
</tr>
<tr>
<td>T/L</td>
<td>Teaching and Learning</td>
</tr>
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</table>
CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Performance in the National Examinations is seen as the greatest single influence on the school curriculum and children's learning in Kenya. The education system in Kenya is quite result oriented and any school or pupils' performance is measured by how well the pupils have performed. Muchira (1983) stated that, "The future of students in Kenya is so dependent on how well they perform in National Examinations. This is because examinations play the important role in the selection a few candidates for further education and for entry into formal employment."

Poor performance in mathematics is not a recent problem. Worldwide, the subject suffers a minority acceptance. Being a focal subject in achievement of industrialization, the problem may be among other causative factors, against fast industrialization in developing countries. In Kenya, yearly, mathematics has never gone missing in the subjects badly performed in the KCPE. Years back the situation was no better for mathematics. In the study by African Academy of Science in several countries in Sub Saharan Africa (East African Standard, 1999), it was revealed that less than 10% of all candidates who sit for national examinations pass in mathematics. NGO Benin, (1996), reported that the performance in mathematics in Kenya is very poor because pupils dislike the subject. Learners in our education system perceive mathematics as a difficult subject and this is best reflected in the performance of mathematics by learners in teacher made tests and national examinations. While this is happening, mathematics is expression of ideas, human mind and it reflects on active will, contains passive reasoning and desire, an aesthetic perfection, (Richard Conrant and Herbert Robbins 1941).
In life, we are confronted with many problems that require us to express them in mathematical statements, to assist us in solving them. Mathematics is a study of numerals and requires deep reasoning. It is a creation of the human mind concerned principally with ideas, processes and reasoning. (Johnson and Rising, 1972).

Mathematics is a group of related subjects that include Algebra, Geometry, Trigonometry and others. It is abstract in nature when studied under topology (Borowakie and Borwen, 1987). This shows that mathematics is a wide subject requiring a lot of time and dedication in order for one to understand the underlying concepts. Thus, interest in the improvement of pupils’ examination performance in mathematics in public primary schools had led to the study of factors contributing to poor performance in mathematics at KCPE level in Isiolo District.

Duignan (1986), states that, “there are multifarious factors which influence students’ achievement either directly or indirectly. Some of these factors are external to the school, while others are part of the intricate web of influences that operate within the school itself”. Examples of factors that are external to the school may include the following; social-economic background of the learners, family residence, family status, (single or not), geographical factors and religion. Factors within the school that influence poor performance of pupils at KCPE may include; high teacher/pupil ratio, resources/facilities, learning environment, school tradition and pupils and teachers’ attitudes.

Learners in our education system will always be affected whenever the above factors do not offer conducive environment for learning or studying. A combination of these factors will influence pupils’ performance at KCPE level. The study was therefore aimed at investigating how and why, teacher pupil ratio, social-cultural background,
resources and facilities, syllabus coverage and teachers and pupils' attitudes towards mathematics, influence performance at KCPE level in Isiolo District.

1.2 The Statement of the Problem

Worldwide, the performance in mathematics in examinations by pupils/students has been poor. Poor performance in mathematics is not a recent phenomenon. The subject suffers a minority acceptance, though it is a focal subject in industrialization and is useful in human being's everyday life. In Kenya, every year the subject never goes missing in the category of poorly performed subjects in national examinations; be it KCPE or KCSE. Years back, the situation was no better.

To this end, the central problem was that despite the fact that over 80% of the primary school children are in public schools, these children are not performing well at KCPE especially in mathematics. The following table shows Isiolo District KCPE results analysis (in subjects mean scores) for the last three years.

<table>
<thead>
<tr>
<th>Table 1.1 Isiolo District KCPE mathematics mean score for the last 3 years.</th>
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<tr>
<td>Source: District KCPE Results Analysis for 2002, 2003 and 2004</td>
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<table>
<thead>
<tr>
<th>YEARS</th>
<th>MATHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>47.06</td>
</tr>
<tr>
<td>2003</td>
<td>47.14</td>
</tr>
<tr>
<td>2004</td>
<td>46.86</td>
</tr>
</tbody>
</table>

Mathematics takes one of the lowest mean scores in the district. The mean score for each of the last three years was below 50%.
The figure shows in the year 2003 mathematics mean score improved slightly by 0.08 but declined again by 0.28 in the year 2004. This raised the overall concern as to “what could be the critical factors causing this dismal performance in mathematics”.

1.3 Purpose and Objectives of the Study

The broad purpose of this study was to investigate factors contributing to pupils’ poor performance in mathematics at KCPE level in public primary schools in Isiolo District. The study was to establish the relationship between the factors and performance of learners in mathematics. The specific objectives of the study were five fold:

(i) To find out the nature and adequacy of facilities used in teaching mathematics in the selected schools.

(ii) To find out whether mathematics syllabuses are covered effectively and on time.
To determine teacher/pupil ratio in the selected public primary schools.

To establish the attitude of learners and teachers towards mathematics.

To investigate about social cultural background of the learners that might affect their overall performance and mathematics in particular

1.4 The Research Questions

The study attempted to generate answers to the following research questions:

1. a) What was the availability and adequacy or physical resources such as mathematics teaching aids, textbooks, classrooms, desks, teachers etc in public primary schools in Isiolo District?

b) What were the Qualifications and teaching experiences of the teachers in Isiolo District?

2. Were mathematics syllabuses covered effectively and on time?

3. What was the average pupil/teacher ratio in public primary schools in Isiolo District?

4. What was the pupils and teachers attitude towards mathematics?

5. What social cultural factors affected the teaching/learning of mathematics?

1.5 Scope and Limitations

1.5.1 Scope

The study targeted Isiolo District of Eastern Province of Kenya. This was because unlike other districts of Kenya, Isiolo has got her unique problems such as unconducive climate (ASAL), banditry and very scattered schools. Six public primary schools were targeted because despite all odds, most children were in public primary
schools. Public primary schools within reach from Isiolo town were selected because they were more secure and accessible than those schools in the interior or far from town.

The study confined itself to head teachers, teachers, pupils and parents/guardians. These were directly concerned with examination performance, which measured their achievement. The teachers and pupils included in the sample were those in session.

1.5.2 Limitations

The main constraints encountered in this study were as follows:

(a) Physical conditions such as harsh terrain, hot conditions and long distances were obstacles that could have hindered a smooth fieldwork research.

(b) It was not possible to cover the opinions of other education stakeholders since tracing them was difficult and could require considerable time, resources and other logistics.

(c) There was dearth in literature on examination performance particularly that of mathematics in ASALs.

(d) The results and conclusions drawn from data collected could not be fairly district generalized because the research was conducted in only 6 schools out of 46.

(e) The views of the respondents interviewed could be different in magnitude and nature, from those of other people in other schools in the district.

(f) Lack of funds for travelling (fare), purchasing stationery, photocopying of the questionnaires and subsistence was a problem to the researcher.
(g) Time limit of three months was found to be very prohibitive because of need for precision.

1.6 Delimitations of the Study

The study confined itself to six schools in Isiolo District. The six schools were public primary schools only. The pupils and teachers involved were from public primary schools and those in session.

There were several factors affecting mathematics performance at KCPE level, but the study was only focused on the following; nature and adequacy of resources and other facilities, syllabus coverage, teacher/pupil ratio, attitude of learners and teachers towards mathematics and social-cultural background of the learners in the study district.

1.7 The Assumptions of the Study

(i) The study assumed that the respondents to questionnaires and interviews were to cooperate and provide a sincere and honest view during data collection.

(ii) It was assumed that the 6 out of 46 KCPE schools represented generally the true picture of the KCPE performance and subsequently the general performance in mathematics at KCPE level in public primary schools in Isiolo District.

(iii) All the pupils selected for the study had undergone same level of tuition in terms of teaching time and syllabus coverage.

(iv) The study assumed that all pupils were of sound mind (mentally fit) and share the same geographical conditions of Isiolo District.
1.8 Significance of the Study

This study was of importance and of great assistance to Moest, selected schools and parents. MoEST is charged with the responsibility of promoting education in the country. All Kenyans must ensure effective and efficient operation of their education institutions because the future of the youth is dependent on how well they perform in national examinations.

The study revealed the factors influencing mathematics performance in public primary schools in Isiolo District. For the factors against good mathematics performance in public primary schools, action plan was to be drawn by all the stakeholders.

However, since more children are in public schools, it was necessary for educators to look into ways of improving the examination performance particularly in mathematics in public primary schools. This was because currently, a certificate without good grade in mathematics is termed as a weak one by the prospective employers.

The study was of great help to pupils, as it revealed important information on why they perform poorly in mathematics and gave them a way forward.

This study enabled the public primary schools managers to address themselves on whether public primary schools could be made to perform well in mathematics.
Finally, the study was of great help to the scholars, researchers and students of curriculum development by giving them support information in pursuing studies in the same problem.

1.9 Conceptual Framework

The conceptual framework for the proposed study was based on the expectancy theory of motivation. According to this theory, motivation is the force to perform. It has a degree of intensity and direction (Orodho, 2004).

In the model below, a motivated pupil by factors such as parents/guardian support, teacher support and enough assignment, could choose to follow path A. Once motivated to learn, the pupil could be willing to do assignments, be active in class and discuss with his/her teachers about school issues like mathematics’ difficulties. This could give the learner a positive attitude towards learning and especially doing mathematics. Positive attitude could arouse the learner to practice further mathematics and ask his/her teachers questions pertaining the subject. This was therefore to lead to good achievement in mathematics at KCPE level.

Demotivation on the other hand caused learners to be reluctant to learn especially mathematics. Poor and inadequate resources, lack of support from parents and teachers, inadequate assignments and others, could bring about demotivation of learners. Demotivated pupil chose to follow path B that led to poor performance in mathematics at KCPE level. Demotivated learners become lazy and passive in class. The learners do not bother asking the teacher any question or expressing their difficulties. This led to low attitude towards learning especially in mathematics. As
such, learners could not put any effort to calculating mathematics and this led to poor performance. The model below, figure 1.2 showed the path followed by both motivated and demotivated pupils in a school.

**Motivated by:**
- Parent support
- Teacher support
- Love and security
- Enough assignment

**Demotivated by:**
- Inadequate and poor resources and facilities
- Lack of support from parents and teachers
- Lack of love and security
- Outdated cultural believes
- Inadequate assignments

**Path A**
- Willingness to learn
- Doing assignments
- Discussions with teachers and parents

**Path B**
- Reluctant to learn
- Indiscipline
- Laziness
- Passiveness
- Insecurity

**Motivated by:**
- Positive attitudes towards learning mathematics
- Intense effort in practicing mathematics
- Good achievement in mathematics at KCPE

**Demotivated by:**
- Negative attitude towards learning mathematics
- Less intense effort
- Poor mathematics performance in KCPE

*Figure 1.2 The conceptual framework on factors contributing to pupils’ poor performance in mathematics at KCPE level.*
The model above showed that with motivation, which is a force to perform, the results were excellent and vice versa with demotivation.

1.10 Operational Definition of Central Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Baraza</td>
<td>A meeting held to address various community issues</td>
</tr>
<tr>
<td>Chang’aa</td>
<td>Referred to local/traditional brew</td>
</tr>
<tr>
<td>Cushites</td>
<td>Referred to tall light skinned people with soft hair who occupy some parts of Eastern and North Eastern provinces of Kenya. These people live nomadic life</td>
</tr>
<tr>
<td>Convenient Sampling</td>
<td>Referred to when samples are selected based on ease of assess; for example near the schools</td>
</tr>
<tr>
<td>Descriptive Survey</td>
<td>Referred to non-experimental method of conducting research and dealt with views of people. It was concerned with identification of factors</td>
</tr>
<tr>
<td>Facilities</td>
<td>Referred to things like desks, chairs, classrooms etc</td>
</tr>
<tr>
<td>Locale</td>
<td>Referred to locality of operation</td>
</tr>
<tr>
<td>Madrasa</td>
<td>Religious School for Islamic children</td>
</tr>
<tr>
<td>Nomads</td>
<td>These were people of tribes roaming from place to place in search for pasture and water for their herds</td>
</tr>
<tr>
<td>Performance</td>
<td>This referred to ability to do something</td>
</tr>
</tbody>
</table>
Purposive Sampling This was a method that involved selecting samples using set criteria like type of school (national or provincial)

Sampling Matrix This was the basis on which the research was developed, like the sample schools and people included in the study

Reliability This was a measure of the degree to which research instruments yielded consistent results after repeated trials

Resources Referred to materials used to enhance and facilitate teaching and learning of mathematics, like models of different shapes and textbooks etc

School Curriculum This was the course of study followed in school, that is from class 1 to 8 in primary schools

Teacher/Pupil Ratio This was the number of pupils handled by one teacher i.e. 1:40 is the recommended ratio

Validity This referred to the quality of data gathering instruments
CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter was devoted to reviewing literature in many areas that were relevant to the study, that is, factors contributing to poor performance in mathematics at KCPE level in public primary schools. It was meant to support the general assumptions of this study. There were several articles and research reports that had been written on the same subjects but there weren’t much written on mathematics performance at KCPE level, particularly in Isiolo District.

2.2 Literature Related to Physical Facilities

Mbaabu (1983), revealed that lack of physical facilities is a problem within the school which the head teachers are faced with. He implied that in an attempt to have adequate and comfortable physical facilities in their schools, head teachers face challenges. This may be due to financial constraints and most probably uncooperative stakeholders.

Eshiwani (1983) continues to say that the presence or absence of school facilities distinguished high achieving from low achieving schools. Lack of facilities could be a major contribution to the poor performance in the National Examinations. He put forward that lack of physical facilities might affect examination performance adversely. Think about mathematics when pupils are congested in a classroom and worse more, squeezed on their desks. They can absorb very little about mathematics. They (pupils) are mainly not comfortable and hence the learning environment is not conducive.
Aduda (2004), "... Public schools on the other hand lack facilities and have inadequate teachers, which was made worse with the introduction of free primary education (FPE)" Hence children in public primary schools learn in poorly equipped schools and in more congested classrooms. (Daily Nation, 2004).

Thus, studies in a number of African countries have found a strong association between resources and students' achievement, (Foster, 1980; Foster and Clignet, 1966; Heynemann, 1984). Where students are less congested in their learning environment, they tend to perform better in national examinations. This is because they are relaxed and work freely, since there is enough space. On comparing and contrasting examination performance between public and private primary schools, it is said that private schools perform better because they have adequate physical facilities and learn in less congested classrooms. This therefore give a close relationship between examination performance and physical facilities like classrooms, desks and even playgrounds. The above context shows that physical facilities in a school are an important aspect in a school situation.

2.3 Literature Related to Teaching and Learning Resources

Among the most recent studies undertaken in Kenya regarding factors influencing academic performance are those carried out by Kathuri (1982), Mwangi (1983) and Maundu (1986). Studies in the past have found a strong association between resources availability and effective use has been consistently related to achievement in less countries like Kenya. The impact of instructional materials especially those directly related to reading and writing were dominant across several studies.
Recent studies show that textbooks availability was positively related to achievement, Orodho (1996). The textbooks as a teaching resource help individualise instructions and give students a chance to refer areas he/she did not understand during the lesson. Angura (2003), states that the schools with adequate textbooks, apparatus and other instructional materials are at an upper hand of performing better.

Ayot (1984), psychologist suggests that out of all that we hear and see, we learn only 10% through our sense of hearing and 80% or more through the sense of sight. We retain about 20% of all that we hear and 50% of what we see and learn. This suggests that teaching and learning resources are of paramount importance in teaching and learning situation.

Court (1974), identified the distribution of resources such as textbooks and other equipments as a major factor that counts for scholastic differences among schools. This means that, with many pupils sharing one textbook, studies done will be inadequate and this will lead to poor performance.

Kathuri (1986), tried to correlate the utilization of teaching resources with performance in CPE. Where teaching resources like textbooks were adequate, studies are done and this lead to better performance by the pupils at National Examinations.

Duignan (1986), identified the examination performance influencing factors as school resources and class size. The more the resources, the better for the pupils. Lack of teaching and learning resources would always lead to pupils’ poor performance.

Thus, Isiolo District being one of the Districts in ASAL areas could be having schools suffering from lack or shortage of teaching and learning facilities. Teaching aids are important teaching tools. They enhance and facilitate teaching and learning.
Otherwise, in their review of research on the determinants of school achievement in the third world counties, Schiefelbein and Simon (1981), and Eshiwani (1982), have identified school resources and processes as one of the policy related factors that may cause poor academic performance.

2.4 Literature Related to Social Cultural Background of the Learners

Kariri (1984) in a survey of KCE performance in urban areas said, “Academic performance is a product of environmental factors, coupled with internal factors within the pupils, teachers and the neighbourhood”. This is true to KCSE as well as in KCPE. These indeed influence performance particularly in mathematics at KCPE. For example, the culture that does not encourage the education of girl child will not see need for performing well in KCPE. This may be the case with the people of Isiolo District.

Mwangi (1985), has stated the following in relation to examination performance, “The education level of the parents was also found to be very significantly related to performance. Those students whose parents featured prominently in higher levels of education had a “Good” performance in maths”. With respect to parents’ occupation, this was also found to be very significantly related to performance. Parents who have good and well paying jobs have their children performing well in National Examinations. This is probably because they can support their children’s education.

Parents’ place of residence was significantly found to be related to performance. This was because pupils whose parents resided in urban centres, dominated the good performance categories. Important learning and teaching facilities are available in urban areas unlike in rural areas.
Maundu, (1986), in his study found that mothers and fathers educational and occupational status has a significant determinant of achievement in CPE when all the school types are treated as a unit.

Eshiwani (1983), states, “Factors that influence achievement fall under two major categories, that is social-environmental factors and school factors.” Thus, the social influence that communities have on schools was sited as one major factor that may have adverse effect on the schools’ performance.

2.5 Literature Related to Teacher/Pupil Ratio

Eshiwani (1983) states, “Social and environmental factors and schools factors such as streaming effect and class size, influence achievement in schools”. The optimal number of students per class which is 1:40 (one teacher per every forty pupils) is a very important educational issue because of its cost implications. Where class size is expanded by one or two pupils, there isn’t much effect on teaching and learning, but where the class size is blown up by as much as 20%, this tend to have a negative effect on students’ achievement.

Duignan (1986), also cite teacher/pupil ratio as a factor influencing examination performance. According to Duignan (1986), teacher/pupil ratio relate very well with pupils’ performance. A big class size, which is above optimal class, that is 1:40 would affect the performance in mathematics adversely. When teaching such a class, a teacher would not be able to go round the class helping weak students neither can he/she be able to mark exercises and homework effectively. This therefore contributes to poor performance in mathematics at KCPE level.
2.6 Literature Related to Pupils and Teachers' Attitude Towards Mathematics

Okech (1986) states, “Members of the public and teachers of mathematics do believe that the attitudes of teachers towards mathematics are of paramount importance and that a major task of these teachers is to promote positive attitudes in their students”. A number of studies that have been concerned with determining the teachers and pupils' attitude towards mathematics have been carried out. The findings from such studies have indicated that students' attitudes towards mathematics is positive in the early years of primary schooling, but a decline appears as they progress to upper classes. These findings agree with the works of Aiken (1972), which revealed that teachers' attitudes and effectiveness as being determiners of students' attitudes and performance in mathematics.

Other studies give us some evidence on the importance of the teacher to mathematics' attitudes development. Phillips (1973) published results of his study that the teachers' attitudes towards arithmetic are significantly related to the students' attitude and development.

Aiken (1970) examined the various studies carried out during the 1960s, which dealt with the relationship of attitudes and achievements in elementary school mathematics. The results of these studies indicated that there is a modest positive relationship between attitude and achievement in elementary school mathematics. The current school programmes results in substantial decline in the favourableness of attitude towards learning mathematics as children progress through school. In another study, Dutton (1956) found that standards 5 and 6 were the most crucial in the development of attitudes.

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Thus, lack of adequate remuneration and staff appraisal lowers teachers’ attitude and morale towards teaching, particularly teaching of mathematics which requires teachers’ effort and devotion. With low attitudes towards the teaching and learning of mathematics, this leads to poor performance in the subject at KCPE level.

2.7 Literature Related to Syllabus Coverage

Mwangi (2000) states that syllabus coverage is important in any curriculum. Mathematics syllabus for all classes from Std. 1 - 8 should be effectively covered and completed at each level (classes). This will enhance effective teaching of mathematics at Std. 7 and 8.

In Kenya, syllabus coverage becomes difficult. This is because of overloaded syllabus, which leaves no time for deep teaching or remedial teaching. The syllabus is too difficult for the average Kenyan child. Games and puzzles topics are scaled down due to lack of time. Drilling of pupils for examination results is more emphasized rather than teaching for understanding.

Mwangi, (2000) continues to say that practical teaching aids are not available in schools and this does not enhance or facilitate the teaching of mathematics. Problem solving activities are not emphasized and finally guided discovery methods are used rather than exploratory methods. Hence, teaching of mathematics is not well delivered.

2.8 Summary

The review of literature was done with the purpose of identifying the gaps in knowledge regarding factors that influenced students’ performance in KCPE in public primary schools.
The chapter looked at literature review related to factors that influence examination performance at KCPE level. These factors were resources and facilities, syllabus coverage, pupils’ and teachers’ attitudes, teacher/pupil ratio and social cultural background of learners. While all other factors influencing examination performance at KCPE were the same as those influencing elsewhere in the country, social-cultural background was different. Isiolo District being one of the ASAL districts had unique geographical factors (high temperature and long distances), economic activities (nomadic life) and a culture characterized by Islamic religion. The researcher wanted to establish mainly to what extent social-cultural background of the learners affects their learning and subsequently their examination performance at KCPE level.

Review of literature supported the facts that performance in mathematics at KCPE level has not been good almost worldwide. The subject suffers minority acceptance. However, being a focal subject in every human being’s everyday life and in achievement of industrialization in any country, the subject is of paramount importance.

To this end, this study was to establish the crucial factors influencing students’ examination performance at KCPE level in Isiolo District.
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Research Design

This research was aimed at finding out factors contributing to poor performance in mathematics in public primary schools. The information was collected from pupils, teachers, head teachers AEOs and opinion leaders. The study adopted a descriptive survey. This was because descriptive survey method deals with views of people and how they are related to the phenomenon being studied. The locale of the study was Isiolo District. Selection criteria will be discussed in an appropriate section of this chapter.

3.2 Locale of the Study

The locale of the study was Isiolo District of Eastern Province, Kenya. Isiolo District is one of the ASAL districts in Kenya. Majority of her people are Cushites. However, there are a few immigrants from all over Kenya mainly as government workers/officers and from the neighbouring districts like Meru Central, Meru North and Laikipia. This unique combination of people of diverse backgrounds provided an appropriate/scenario population, for understanding the factors influencing students' poor performance in mathematics.

The study considered Isiolo as the district of study because it had unique factors that affected KCPE performance particularly in mathematics. Its unique factors included, unique geographical position and climate, type of people mainly Cushites who are herders and nomads and a unique religion that was dominantly Islam. Thus, a study of Isiolo District was likely to reveal what affects performance at KCPE level in other
districts that fall under the same category. Such districts may include Marsabit, Moyale, Wajir etc.

3.3 Target Population

The population studied in the research consisted of all the 46 public primary schools in Isiolo District with KCPE level students. The study targeted head teachers, teachers, pupils, opinion leaders and AEOs who were concerned with achievement in KCPE examinations. Teachers targeted were those teaching mathematics in upper primary. All pupils in upper primary were studied. The classes targeted were classes 6, 7 and 8.

3.4 Sample Selection

The sample used was selected through simple random sampling and purposive sampling methods.

Out of the total 46 public primary schools, 6 schools were purposively selected using the criteria of KCPE performance, size of the school and rural or urban status. This was about 15% of the total KCPE public primary schools in Isiolo District. Therefore, the criterion for selecting the 6 schools were as follows:

- A top ten school in the KCPE for the last 3 years
- One school from the bottom ten in the KCPE for the last 3 years
- One double streamed and a medium school
- One school with the lowest enrollment in the district
- A school within the town
- One rural school
According to the above criterion, the following 6 schools were selected for study.

Table 3.1: Shows selected schools and zones they were found in and criteria for their selection.


<table>
<thead>
<tr>
<th>SCHOOLS</th>
<th>ZONE</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isiolo Barracks</td>
<td>East</td>
<td>Good performance</td>
</tr>
<tr>
<td>Bula Mpya</td>
<td>East</td>
<td>Poor performance</td>
</tr>
<tr>
<td>Kilimani</td>
<td>West</td>
<td>Double streamed and medium school</td>
</tr>
<tr>
<td>Goda</td>
<td>Merti</td>
<td>Lowest enrollment</td>
</tr>
<tr>
<td>Wabera</td>
<td>East</td>
<td>Town school</td>
</tr>
<tr>
<td>Elsa</td>
<td>East</td>
<td>Rural school</td>
</tr>
</tbody>
</table>

From the 6 selected schools, all the head teachers were included in the sample. Two mathematics teachers, teaching upper primary i.e. Std. 6 - 8 from each of the sample school were selected for study. One hundred and twenty pupils were included in the sample. Each of the 6 schools had 20 pupils for study. These pupils were randomly selected from each of the upper classes for study. At least 12 or 60% of the pupils were boys and 8 or 40% were girls. This was for the purpose of gender balance. Girls took the smallest percentage because only a few girls attend school due to social cultural reasons. Three age groups of children were considered for study. These were 8 - 10 years, 10 - 12 years and 12 and above years. The 3 AEOs in the district were considered for study. Four opinion leaders from each of the selected schools were also selected for study. These were parents, chiefs or councillors. Convenient sampling
was most appropriate for their selection. Thus, the entire sampling matrix yielded a total sample size of 165 respondents, for the study.

Table 3.2: The table below showed the entire sampling matrix for the study.

<table>
<thead>
<tr>
<th>POPULATION</th>
<th>SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEO (3)</td>
<td>3</td>
</tr>
<tr>
<td>Opinion leaders (4 x 6)</td>
<td>24</td>
</tr>
<tr>
<td>Head teachers (1 x 6)</td>
<td>6</td>
</tr>
<tr>
<td>Teachers (2 x 6)</td>
<td>12</td>
</tr>
<tr>
<td>Pupils (20 x 6)</td>
<td>120</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>165</strong></td>
</tr>
</tbody>
</table>

3.5 Data Collection Instruments

Data for the study was collected using questionnaires, interview schedules and observations. This was in conformity with what Saunders (2003) argues that, using multi-instruments in data collection enhances data collection and credibility of the results of the research. Questionnaires were best for the AEOs, head teachers, teachers and standard 7 and 8 pupils. This was because these pupils could read, understand and were able to fill in the questionnaires. On the other hand, interview schedules were administered to the opinion leaders. Open questions were used mostly to allow respondents free responses and greater depth. In the interview schedules, topic and issues to be covered were specified, sequenced and wording of questions done well. This was for the purpose of increasing the comprehensiveness of data and making data collection somewhat systematic for each respondent.
Questionnaires were used to supplement interview schedules, where necessary. These instruments provided greater depth of information and any clarification could be sought in the process. The two instruments were flexible and allowed good rapport with respondents, hence getting information easily, (see appendix B, C, D, E and F).

On visiting the schools to deliver the questionnaires, collect the questionnaires, and to carry out interview schedules, the researcher at the same time collected primary data. This was done through observation of resources and facilities, class size through physical checks of class registers, form As and classroom observation.

3.6 Piloting of Research Instruments

A pilot test was carried out for testing the instruments for corrective purposes, adjustment and for administrative logistics. The researcher carried out the pre-testing of questionnaires administered to 5 respondents, purposively selected from identical schools to the actual sample schools. This was done with a view of determining reliability and validity of the instruments. Reliability of measurements concerned the degree to which a particular measuring procedure gave similar results over a number of repeated trials. Content validity referred to establishing whether data collection instruments measured what they were intended to measure. To determine reliability, test retest method was used to the same group of the respondents from the identical schools. For content validity, the researcher invited 5 expert mathematics teachers from some other identical schools to discuss the content of the instruments. These were mainly those teaching mathematics and who participated in marking KNEC examinations. The 5 teachers were requested to read through the instruments and check whether the content was relevant or to the level of all involved. The
recommendations that were obtained from the 5 judges were therefore incorporated in
the final instruments. Hence, any ambiguities in the instruments were deleted.

3.7 Data Collection Techniques

The researcher sought for permit from the Permanent Secretary (PS) of MoEST to
allow her carry out the intended research. Using the introduction letter from Kenyatta
University and the permit from the PS, the researcher then sought permission from the
Isiolo DEO to carry out the research in the district. Thus, the DEO allowed the
researcher to select the sample schools and visit the selected schools to carry out the
research.

From the DEO’s office, the researcher got the Isiolo District KCPE results analysis
from which mathematics mean scores for the selected schools were found. Questionnaires
were administered to standards 7 and 8 pupils, head teachers, teachers
and AEOs. Where the researcher could not reach because of geographical distance
and insecurity, mailed questionnaires were used. The Opinion leaders were
interviewed using structured interview guides. Using the interview guides, the
researcher probed the respondents where necessary to get the intended information.

On conducting interviews, the researcher used verbal communication in Kiswahili
language which was widely spoken and understood by a majority people of Isiolo.
The researcher made observations of variables such as physical facilities, scholastic
resources and class size. The researcher had classroom observation to observe pupils
and teachers behaviour during the lesson. This helped the researcher to gauge pupils’
attitudes towards mathematics.

3.8 Data Analysis
The data were analysed descriptively. Tables, frequencies, graphs, charts and percentages were used to present the data. Tables were used because they were easy to interpret. Frequencies and percentages were convenient in giving a general overview of the problem under study. They also made it easy to deduce conclusions and make recommendations for the study.

**SUMMARY OF RESEARCH DESIGN**

Formulation of the study problem

Research target population

Sample

Selected schools

Piloting

Development of research instruments

Revision of instruments

Data collection

Data analysis and writing report

Discussion of the results

Fig. 3.1  *Source: Adopted from Cohen and Manion (1984 - 1989)*
CHAPTER FOUR
RESEARCH FINDINGS AND ANALYSIS OF RESULTS

4.1 Introduction

This chapter looked into the research findings according to the laid down objectives of the study. The objectives of the study were as follows:

(a) To find out the nature and adequacy of facilities used in teaching mathematics in the selected schools.

(b) To find out whether mathematics syllabuses are covered effectively and on time.

(c) To determine teacher/pupil ratio in the selected public primary schools.

(d) To establish the attitude of learners and teachers towards mathematics.

(e) To investigate about social cultural background of the learners that might affect their overall performance and mathematics in particular at KCPE.

An analysis of the data collected through questionnaires, interview schedules and observation was made. The data was presented in tables, charts, frequencies and percentages. Analysis was done through classifying sample schools into high/low performing schools and to some extent urban/rural schools, clusters.

4.2 Nature and Adequacy of Facilities

The first objective was to find out the nature and adequacy of facilities and materials used in teaching and learning of mathematics. Physical facilities and teaching/learning materials are important determinants of pupils’ performance in mathematics. Enough classrooms and spacing allows both learners and teacher to make movements, demonstrate and discus during the lesson. Teaching/learning aids facilitate the
process of teaching and learning in mathematics. Availability of these facilities and resources determines the performance in mathematics, which requires a lot of practice, discussion and demonstration. The following table shows pupils responses on textbook/pupil ratio.

Table 4.1 Shows analysis of textbook/pupil ratio from pupils’ questionnaires

<table>
<thead>
<tr>
<th>Ratio</th>
<th>High Performing Schools</th>
<th>Low Performing Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1:1</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>1:2</td>
<td>41</td>
<td>68</td>
</tr>
<tr>
<td>1:3</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>1:4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

According to the above table, three quarters of pupils in high performing schools had a low textbook/pupil ratio of between 1:1 and 1:2, as compared to their counterparts in low performing schools, where two thirds of pupils share textbooks at a ratio of between 1:1 and 1:2. On the other hand, only one quarter of pupils in high performing schools had a high textbook/pupil ratio of between 1:3 and 1:4, while in low performing schools one third of the pupils had a high ratio of between 1:3 and 1:4. This explains why low performing schools do not do well in mathematics at KCPE level. The researcher also deduced that textbooks were not enough for every child whether in high performing or low performing schools. Hence, this could be the cause to poor performance in mathematics.
About three quarters of the head teachers agreed that physical facilities such as classes, desks and instructional materials were quite inadequate in both high performing and low performing clusters. However, one third of the head teachers admitted that due to Free Primary Education (FPE) exercise books were quite adequate and textbook/pupil ratio will soon be optimal. Half of the head teachers said that it was difficult to get adequate facilities and material resources, due to lack of funds and uncooperative parents.

According to the Area Education Officers textbooks and mathematical sets were available but the ratio was not encouraging. Teaching and learning aids such as charts, Abacus and others were lacking, hence poor performance in mathematics at KCPE.

During the study, teachers were asked to indicate the adequacy of physical facilities and teaching/learning materials in their schools. That is, whether these facilities were very adequate, adequate and inadequate as shown in the table below:

Table 4.2  Shows analysis of facilities from teachers’ questionnaires

<table>
<thead>
<tr>
<th>Types of facilities</th>
<th>High Performing</th>
<th></th>
<th>Low Performing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VA</td>
<td>A</td>
<td>IN</td>
<td>VA</td>
</tr>
<tr>
<td>Classes</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Desks</td>
<td>2</td>
<td>33</td>
<td>4</td>
<td>67</td>
</tr>
<tr>
<td>T/L resources</td>
<td>1</td>
<td>17</td>
<td>5</td>
<td>83</td>
</tr>
<tr>
<td>Maths Textbooks</td>
<td>6</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Exercise Books</td>
<td>1</td>
<td>33</td>
<td>4</td>
<td>67</td>
</tr>
<tr>
<td>Mathematical Sets</td>
<td>5</td>
<td>83</td>
<td>1</td>
<td>17</td>
</tr>
</tbody>
</table>

30
According to the above table, over three quarters of the teachers in both low and high performing clusters agreed that mathematics textbooks and exercise books were quite adequate. However, other necessary resources like classes, desks and T/L resources were quite inadequate particularly in low performing cluster. In some schools, the researcher observed that most of the above facilities like desks were quite inadequate such that some pupils sat on the floor during the lesson. The implication was that inadequate facilities led to congestion in classes and squeezing on the desks, thus hampering smooth learning of mathematics.

4.3 Mathematics Syllabus Coverage

Effective syllabus coverage is important in a school curriculum (Mwangi: 2000). Lack of syllabus coverage or ineffective coverage may contribute to poor performance in mathematics at KCPE. In some schools pupils cannot do well in mathematics at KCPE, although they may have been taught effectively in Std 7 and 8. the reason is actually lack of syllabus coverage at lower classes like in STD 4, 5, and 6. The mathematics syllabus should be effectively covered at each school level i.e classes. In schools where teachers cover the syllabus on time, pupils tend to do well in mathematics at KCPE level.
Syllabus coverage varied from one school to another and the difference in coverage was small.

During the study, the teachers’ respondents were asked to say whether they covered mathematics syllabus always, sometimes, never or seldom. The table below indicates their responses:

**Table 4.3 Shows analysis of syllabus coverage from teachers’ questionnaires**

<table>
<thead>
<tr>
<th>Teachers’ Opinion</th>
<th>High Performing</th>
<th>Low Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>Sometimes</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Never</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>Seldom</td>
<td>1</td>
<td>17</td>
</tr>
</tbody>
</table>

The above table shows it was not always that mathematics syllabuses were covered. Only one third of the teachers in each cluster indicated they always covered the syllabus, while one third of the teachers in high performing cluster were sure that mathematics syllabus were never covered. Equal number of the respondents from both clusters indicated that it is only sometimes that teachers cover mathematics syllabus. This implied that lack of syllabus coverage or ineffective coverage could be a factor to poor performance in mathematics at KCPE level.
The head teachers respondents were asked to state whether mathematics syllabuses were covered, always, sometimes or never, covered. The pie chart below shows head teachers’ responses:

**Fig. 4.1  Pie Chart showing head teachers’ responses on syllabus coverage**

**KEY:**

- 61.20 Always 17%
- 61.20 Never 17%
- 237.60 Sometimes 66%

To the head teachers, the main cause of poor performance in mathematics at KCPE, was lack of syllabus coverage. Over three quarters of the head teachers in both high and low clusters admitted that mathematics syllabuses were sometimes covered, and other times they were not covered at all. This led to poor performance in mathematics at KCPE.
Area Education Officers concurred with the head teachers and teachers that mathematics syllabus was not always covered. Since AEOs work hand in hand with Quality Assurance and Standards Officers in the division, they had information about syllabus coverage. These indicated syllabus coverage was a major issue in the school curriculum.

4.4 Teacher/Pupil Ratio in Public Primary Schools

Teacher/pupil ratio referred to the number of pupils handled by one teacher. To a large extent, teacher/pupil ratio may be determinant to performance in class, particularly in a class of mathematics. School factors such as streaming effect and class size, influence achievement in schools (Eshiwani 1983). The optimal number per class is 1:40. Where class size is expanded by one or two pupils, there isn’t much effect on teaching and learning, but where the class size is blown up by as much as 20%, this tend to have a negative effect on students achievement. This is because when teaching such a class, a teacher would not be able to go round the class helping weak pupils nor be able to mark exercises and homework effectively. The table below shows various teacher pupil ratio in the sample schools.

<table>
<thead>
<tr>
<th>Schools</th>
<th>T/P ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isiolo Barracks</td>
<td>1:33</td>
</tr>
<tr>
<td>Kilimani</td>
<td>1:44</td>
</tr>
<tr>
<td>Bula Mpya</td>
<td>1:34</td>
</tr>
<tr>
<td>Goda</td>
<td>1:18</td>
</tr>
<tr>
<td>Wabera</td>
<td>1:38</td>
</tr>
<tr>
<td>Elsa</td>
<td>1:29</td>
</tr>
</tbody>
</table>
In view of the above analysis, it was deduced that teacher pupil ratio was not much of a problem that led to poor performance in mathematics. The above ratios were very much within the MoEST recommended ratio i.e. 1:40. This implied that the teacher/pupil ratio in Isiolo District Public Primary Schools do not have any adverse effect on the performance of mathematics at KCPE level. The current ratios are manageable and serious teachers can make pupils pass in mathematics. Teachers handling smaller classes as showed above can give and mark as many assignments as possible, hence promoting mathematics performance at KCPE.

The researcher also observed that most schools in Isiolo District had small class sizes. Deep in the interior of Isiolo District, most schools had class sizes of less than 20 pupils per class. For example, in Merti and Kinna Divisions.

4.5 Attitudes of Pupils and Teachers Towards Mathematics

Out of 100% respondents in both high and low performing schools, over half of the pupils liked mathematics and would not like the subject to be optional. This implied that pupils liked mathematics and had positive attitude. Only less than a quarter of the respondents were rewarded when they performed well in mathematics. The rest of the respondents i.e. Over three quarters were either rewarded sometimes or not at all. This implied that motivation among pupils was low and this was associated with low attitude towards mathematics. Out of 100%, Less than half of the respondents agreed that pupils were punished when they failed in mathematics. This demotivated the learners. While about two third of the pupils indicated that they normally used to do
their assignments in mathematics, one third indicated they don’t. Pupils fail to do their assignments because of lack of motivation and thus low attitude towards the subject.

During the study, the teachers were asked to give whether their pupils’ attitudes towards mathematics was either very positive, positive, negative or very negative. Teachers responses were as shown in the table below:

Table 4.5 Analysis of pupils attitude towards mathematics from teachers’ questionnaires

<table>
<thead>
<tr>
<th>Statements</th>
<th>High Performing</th>
<th>Low Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Very Positive</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Positive</td>
<td>4</td>
<td>67</td>
</tr>
<tr>
<td>Negative</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>Very Positive</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

The researcher deduced that over three quarters of respondents (teachers) in low performing cluster indicated that pupils disliked mathematics and had negative attitude towards the subject. This was because pupils perceived mathematics as a difficult subject. Over half of the respondents in high performing cluster agreed that their pupils had a positive attitude towards mathematics. However, about a third of the respondents in high performing schools accepted that some of their pupils had negative attitudes towards mathematics, hence poor performance at KCPE.
Out of the 6 (100%) head teachers from both high and low performing clusters, two thirds of the respondents indicated that most of their pupils had negative attitude towards mathematics. The researcher observed that during mathematics lessons, some pupils sneaked out of the lessons and remained outside until the lesson was over. Some pupils, through interview confirmed this by saying that they do so because they disliked mathematics. All it implied was that, low attitude towards mathematics led to poor performance at KCPE.

The two AEOs concurred with head teachers and teachers that, pupils have a negative attitude towards mathematics. Pupils perceived mathematics as a difficult subject and they felt it was difficult to achieve. It required a lot of practice and assignments.

According to AEOs, teachers had negative attitude towards mathematics due to lack of motivation and interest among their learners. Teachers perceived mathematics as tedious and challenging subject. It required more time and commitment. Head teachers concurred with AEOs that, there was negative attitude towards mathematics on the part of the teachers. Teachers accepted there was negative attitude towards mathematics on their part, due to such reasons as, indiscipline among learners, lack of interest by the learners, poor background of the learners like illiterate parents, who did not support the learning of their children. According to the teachers, laziness among the learners slowed down the process of teaching and learning, hence lack of syllabus coverage and subsequent poor performance in mathematics at KCPE.
4.6 Social Cultural Background of the Learners

To find out how social cultural background of the learners affected children’s performance in mathematics, the sample schools were put in two clusters, urban and rural, for easy analysis. It was also likely that the two clusters had different factors that affected examination performance in mathematics.

Only one quarter of the teachers (respondents) in urban cluster indicated that some of their pupils came from good home background. This was good in terms of family income, parents’ occupation and education level. From such a background pupils could at least get necessary basic needs like light at night, to enable them do their homework. The rest of the respondents maintained that most pupils came from either poor or very poor backgrounds. Majority of the pupils in public primary schools in town came from the slums whose living conditions were poor. Their parents engaged in ‘chang’aa’ brewing, miraa (khat) business and as such, any luxury like paraffin for light at home was not affordable. Such parents were not able or available to support their children in their private studies at home.

Sixty seven percent of the respondents from rural cluster agreed that their pupils came from poor home backgrounds. Most parents were nomads who kept on moving from place to place with their livestock in search of water and pastures. This activity is not compatible to the current education system in Kenya. The movement alone distorted children’s learning and its continuity. From the same rural cluster, the researcher gathered information that people valued the number of animals that one had, than the education of the children. Children were meant to help in grazing of the animals.
Thus, lack of both moral and material support to the education of the children, contributed to poor performance in mathematics at KCPE.

According to the head teachers (respondents), pupils do not come from very good home backgrounds. In both rural and urban clusters, some of the pupils come from very poor backgrounds. That is from poverty-stricken homes where even feeding is a problem. Sixty-seven percent of the respondents in rural cluster supported this fact. The respondents indicated that due to poverty-stricken homes, pupils do not get support from parents in their private studies. Pupils lacked simple things like light in their homes.

Information from the opinion leaders was obtained through interview schedules. These had a lot to tell about the social cultural background of the learners. According to the opinion leaders, children may not be doing well in mathematics at KCPE due to many factors. Illiteracy among parents especially among mothers, do not support the learning of mathematics. This is because in the district, formerly education of girl child was not a priority. This contributed to the production of illiterate mothers. Such mothers could neither encourage nor help their children, in doing their school homework.

Basic religion, which is Islam, is not compatible with the current education system. Majority of school children are Muslims and as a requirement, children are supposed to attend ‘Madrasa’ classes in the afternoons, starting from 3.00 p.m. to 6.00 p.m. This interfered with the normal school learning because in ‘Madrasa’, the language of
instruction was Arabic and the writing was from right to left. This left the children confused.

Social cultural values like early marriages of girls interfered with the learning of the children. A girl may be in school either in lower or upper primary, while marriage negations were going on back at home. Such a pupil cannot concentrate in class, let alone learning of mathematics that requires a lot of practice, assignments and concentration.

Cultural beliefs such as, no one should give the number of livestock that one had to anybody, was a great obstacle to learning of mathematics. This was not culturally allowed for fear of bewitching. Announcing the number of items that one had, was considered a taboo, thus no counting of anything was done. This belief denied children some basic arithmetic skills such as, counting, additions, subtraction, division etc. This meant that, when children first go to school, the work of mathematics teachers was to introduce mathematical concepts like counting to the children and later develop them. This slowed down the process of learning and led to inadequate syllabus coverage.

Tribalism and clanism affected the teaching and learning of mathematics adversely. Borans and Gabras were the two warring tribes/clans. Children from different Boran clans like Karayu, Sakuye, Woljida and Gorrel were such enemies to the extent of not sharing instructional materials such as textbooks in class. Such situations caused distress and tension among pupils and teachers in schools, especially in classes. Discussion groups during lessons were not possible. Teaching and learning was
sometimes made difficult by clan conflicts back at home. Such situations caused instability both at home and at school, and hence resulted to poor performance in mathematics at KCPE.

Teaching of Physical Education for mental development in Islamic schools was to some extent not accepted. For example, Muslim girls were not active in many games like jumping or keeping their legs astride. That was considered as being mannerless. In so doing, physical development was minimal among girls and do not enhance mental development. Thus, learners perceived mathematics as a difficult subject.

4.7 Other Factors Contributing to Poor Performance in Mathematics at KCPE

The researcher gathered other factors contributing to poor performance in mathematics at KCPE. These included the following:

(i) Inadequate teaching staff

The researcher discovered that Isiolo District being an ASAL District did not have adequate teaching staff. This was for the simple reason that education of children was not a priority in the district. Therefore, only a few get educated and the few do not offer enough teaching staff, since not all educated children became teachers.

(ii) Incompetent teachers

Since only a few children were educated in Isiolo District, the government of Kenya gave priority in training to all those willing to be teachers. In so doing, the government lowered the qualification for recruitment to Teachers’ Training Colleges.
As such, people who had a mean grade of D or D - (minus) at KCSE were recruited to train as P3 and P2 teachers.

Table 4.6  Shows teaching staff establishment of Merti Division (from AEOs’ Questionnaires)

<table>
<thead>
<tr>
<th>Grade</th>
<th>ATS</th>
<th>S1</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>8</td>
<td>-</td>
<td>38</td>
<td>37</td>
<td>3</td>
<td>86</td>
</tr>
<tr>
<td>Female</td>
<td>-</td>
<td>1</td>
<td>10</td>
<td>12</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>1</td>
<td>48</td>
<td>49</td>
<td>11</td>
<td>117</td>
</tr>
</tbody>
</table>

The above table shows that P2 teachers were the majority among all other grades. P2 makes 42% of the teachers in Merti division of Isiolo. Since most of these teachers had failed in mathematics at KCSE, they still disliked teaching of mathematics. This was because they felt incompetent in the subject.

(iii) Poor teaching methods

The researcher observed that teachers taught without using teaching aids to enhance and facilitate their teaching and learning of mathematics. Due to this, learning of mathematics was through exploratory rather than discovery methods. Mathematics as a subject required a lot of practice and assignments by the pupils, without which learning of mathematics become difficult. Exploratory methods such as lecture method bores the learners and this alone is enough to cause negative attitude towards mathematics among the pupils. This caused poor performance in mathematics at KCPE.
(iv) **Lack of role models**

Since education is not a priority among the nomadic communities, school children lack good role models like engineers, mathematicians and others whom they can emulate. This caused negative attitude towards mathematics among the learners and therefore was a cause to poor performance in the subject.

(v) **Harsh climatic conditions**

High temperatures and little rainfall if any, characterized the climate of Isiolo. The little rainfall that rains was in most cases unreliable. During the day, it was normally very hot and this made the learning of mathematics, which required great reasoning and a lot of practice, difficult and hence poor performance.

This kind of climate coupled with sandy soils does not allow for alternative economic activities like farming. Farming could be compatible with the current education system because people in question can settle down. Thus, nomadism, which continues to be the major economic activity in Isiolo District, does not favour learning of the children.

(vi) **Single parenthood**

Most children were either orphans or from single parents. This was caused by HIV/AIDS, tribal/clan clashes and vagaries of nature taking its toll. Single parenthood contributed to poor background of the learners and was associated with problems such as; lack of food, lack of parental care and support, and psychological emotions that affected the learners adversely.
(vii) **Language problem**

This was more of a problem in lower primary where mathematics was being introduced and concepts developed. It was mentioned earlier that there were Madrasa classes in mosques held in the afternoons mainly from 3.00 p.m. to 6.00 p.m. These classes start from standard 1 to 6 and from form 1 to 3. Most pupils of Islamic origin were subjected to two systems of learning i.e. school system and Madrasa. In Madrasa classes, the language learnt used for communication was Arabic. This posed a challenge to pupils as Arabic now competed with Kiswahili and English languages learnt in school. This tended to confuse the learner when he/she was back to the school system. Without proper English language, it was difficult for a learner to understand mathematics concepts taught in school.

Madrasa caused another problem to the learners. On leaning Arabic, writing is from right to left as opposed to left-right writing that is taught in schools. This made lower primary pupils to take long to learn good handwriting. It caused confusion to the pupils and hence, pupils got mixed up. In so doing, learning of mathematics was a problem and pupils lacked ample time to do school homework especially that of mathematics, hence poor performance in mathematics.
CHAPTER FIVE
SUMMARY AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the discussions, conclusions, implications and recommendations were summarized according to the objectives of the research. This will be made under the same general themes used in the presentations of results in chapter four.

5.2 Summary

Physical facilities and instructional materials largely determine what pupils learn in schools. A school with adequate classes will shelter pupils without any problem. This makes pupils secure and sheltered from bad weather conditions such as hot and windy conditions. This offers a better learning atmosphere. Adequate classes coupled with adequate and comfortable furniture like desks, chairs or tables would create a better learning environment. When pupils are set to learn in comfortable conditions, they are capable of absorbing more from what the teachers are teaching. This situation would lead to better performance in mathematics. This is because pupils will not be congested in classes, neither will they be squeezed on their desks.

Use of variety of learning resources like textbooks, teaching and learning aids, like different shapes, formulae and concepts would benefit pupils a great deal. This is because learning aids enhance and facilitate learning of the pupils and grasping of difficult concepts. This is in conformity with what psychologists suggest. That is, out of all that we hear and see, we learn only 10% through hearing and over 80% through what we see, (Ayot 1984). Learning and teaching aids therefore increases chances of
greater perception, understanding and retention rate. This is important in the learning of mathematics.

In this research, the researcher found out that public primary schools in Isiolo District have inadequate classes, desks and teaching and learning resources which are an important ingredients to better performance in mathematics. This was attributed to lack of funds and uncooperative parents. This implied that lack of these facilities and resources in public schools could be the cause of poor performance in mathematics at KCPE.

Effective syllabus coverage is very important in a school curriculum. Mwangi (2000) states that syllabus coverage is important in any curriculum. Hence, mathematics syllabus for all classes, lower classes included, should be effectively covered and completed at each level (class). This is the only way to enhance and facilitate better performance in mathematics. Lack of syllabus coverage is attributed to many factors. Some of these factors include, overloaded syllabus, too difficult syllabus for the average Kenyan child and inadequate time that is allocated for mathematics lessons. Other factors may include teachers wasting time through laxity and absenteeism of both pupils and teachers. Poor methods of teaching like lecture method rather than discovery method could be a factor to poor performance in mathematics. This could lead to ineffective syllabus coverage, thus poor performance in mathematics at KCPE.

The researcher found out that teachers do not cover mathematics syllabus effectively and on time and therefore, this could be the cause to poor performance at KCPE level.
Teacher/pupil ratio is an important factor to be considered as far as good performance in mathematics is concerned.

Duignan (1986) stated that, teacher/pupil ratio relates very well with pupils performance. A big class which is above optimal class, that is 1:40, would adversely affect the performance in mathematics. When teaching a big class size, a teacher would not be able to go round the class marking and helping weak pupils, neither can the teacher mark mathematics exercises and homework effectively. This situation would contribute to poor performance in mathematics at KCPE level. The situation would be vise versa when class size is optimal, that is 1:40.

The researcher found out that teacher/pupil ratio in public primary schools in Isiolo District is to the MoEST accepted ratio of 1:40. Out of six sample schools, only one had the recommended ratio and all other schools had a ratio below. This gave the researcher a picture of what may be encountered in the rest of the schools in Isiolo District.

Thus, the research findings showed that teacher/pupil ratio in Isiolo District could not be held responsible for poor performance in mathematics in public primary schools.

The attitudes of learners and teachers are of paramount importance. Attitude largely determines what pupils learn. Mathematics pupils with positive attitude tend to like the subject. Such pupils study mathematics because they enjoy it and get satisfaction from knowing mathematical ideas and concepts. Pupils find mathematics competency as being their own reward. On the other hand, pupils with negative attitude towards
mathematics hate the subject and such pupils try to absent themselves from mathematics lessons. Reasons for negative attitude towards mathematics among pupils may include the following:

- Lack of motivation by teachers and parents
- Lack of support by parents in their private studies like doing assignments and homework
- Teachers setting difficult questions which are above the learners' level
- Teachers attending classes late and leaving before time
- Teachers own negative attitude and getting angry whenever pupils don't understand mathematical concepts

In this research, the researcher found out that according to pupils, (respondents), they like mathematics and they have positive attitude. Otherwise, pupils are demotivated by such factors as, not being rewarded when they perform well in mathematics, they are punished when they fail in mathematics and tend to perceive mathematics as a difficult subject. This makes teachers, head teachers and others, feel that pupils have negative attitude towards mathematics, when they are not.

Teachers attitude towards mathematics are significantly related to the pupils’ attitude and development. A major task of these teachers is to promote positive attitude in their pupils. However, the researcher found out that teachers’ attitude was negative and this contributed to poor performance in mathematics. This could be due to lack of interest by pupils, parents and the entire community. Hence, pupils’ negative attitude coupled with that of their teachers, could be the cause to poor performance in mathematics.
Academic performance is a product of environmental factors coupled with internal factors within the pupils, teachers and the neighbourhood (Kariri 1984). Social cultural factors indeed influence performance particularly in mathematics at KCPE. Pupils from good background tend to perform well in mathematics at KCPE. Background may be determined by parents' occupation, parents' education level and social cultural values such as religion. Research has found out that pupils with educated parents tend to do well in mathematics. Also pupils of employed parents tend to do better in school. Pupils from well to do families tend to get both material and moral support for their education. Those pupils from poor families lack any material and moral support from their parents. Due to this, these pupils tend to perform poorly in academic work especially in mathematics, which requires a lot of practice, materials and devotion. Outdated cultural practices like early marriages for girls interfere with the pupil's learning. Religion as a factor greatly influenced pupils' performance. For example the Madrasa classes mentioned earlier in chapter 4, interfere with normal school learning. Some economic activities like nomadism are not compatible with the current education system in Kenya. Environmental factors like hot climate, windy weather, sandy soils and walking long distances to schools does not favour good performance at school. If anything, these conditions cause a lot of fatigue among the learners. Such conditions contribute to poor performance in mathematics at all levels especially at KCPE.

Cultural beliefs like no counting of items for fear of bewitching, further denied children basic mathematical concepts like counting, adding or subtraction. Hence, children lack important mathematics foundation and this leads to poor performance in mathematics at KCPE.
5.3 Recommendations

The researcher would like to make the following recommendations as per the objectives of the study.

(i) To solve the problem of inadequate physical facilities and teaching resources, the researcher has the following suggestions:

- Education stakeholders at school level should solicit for funds to construct more classes and buy furniture where they are inadequate, buy more textbooks to supplement those bought through FPE funds, provide teaching and learning aids like felt pens, ink, manila papers and others. Feeding programmes should also be supplemented since it is difficult for some pupils to get something to eat back at home.

- Teachers should not solely depend on textbooks, but should also use supplementary books.

(ii) Completing the syllabus and covering it effectively is very important if pupils are to perform well in mathematics at KCPE level. The researcher would recommend the following:

- Teachers should complete the syllabus early enough, say, second term to leave ample time for the pupils to do thorough revision in mathematics, in third term.

- Practical teaching aids should be used in order to facilitate learning and completion of the syllabus.

- Teaching for understanding should be embarked on by the teachers so that the pupils can apply that knowledge to various mathematical problems.

- MoEST should continue unloading the primary school curriculum, to leave a manageable load for teachers and pupils.
• Teachers should not waste time by attending mathematics lessons late and leaving classes early. They should stick to the timetable and obey the school bells.

• Mathematics teachers, at all levels (std. 1 - 8) should be encouraged to complete mathematics syllabus. This way, it will not be cumbersome for std. 7 and 8 teachers to complete the syllabus effectively.

(iii) Teacher/pupil ratio is not a problem to mathematics performance at KCPE. However, the researcher would recommend that all school aged children be sent to school.

(iv) To increase pupils and teachers positive attitude towards mathematics, the following measures should be put in place;

For the pupils:

• Teachers should strive to cultivate positive attitude towards mathematics among learners, by encouraging and motivating learners, giving learners assignments that are to their level and emphasizing on discovery methods rather than exploratory. Parents should be encouraged to help their children in their private studies at home and give them material support. Teachers should give more practical work and assignments to their learners since mathematics requires much practice.

For the teachers:

• Teachers should be committed and devoted to teaching mathematics.

• Teachers’ work should be appreciated by rewarding them when they perform well in mathematics.
• Should be supported by being provided with instructional materials like reference books and other stationeries.

• Should make their mathematics lessons lively in order to avoid boredom.

(v) For social cultural background, the researcher suggests the following recommendations;

• Parents should be encouraged to take their children to school when they are of age.

• Parents should be made aware of the outdated cultural practices such as early marriages for girls. Let the children learn and then marry later, when they are of age.

• Education for the children should not be mixed with Islamic Madrasa. Let the children embark on one system to avoid confusion.

• The Government should continue offering feeding programme in schools to avoid children dropping out due to lack of food.

• Nomads should be encouraged to take up alternative economic activities like farming where possible, so that their children can get time to go to school.

• Parents should be educated whenever public meetings like chiefs barazas are held. It should be based on quality education for the children.

• Tribalism and clanism should be discouraged. The government should come in and try to settle tribal conflicts and clan disputes in order to save lives and spare children’s learning. Many parents die in tribal and clan clashes, thus leaving many orphans and single parents behind. In such an environment, schooling becomes difficult.
5.4 Suggestions for Further Research

This study covered only 6 public primary schools in Isiolo District, Eastern Province. The researcher recommends that further research be conducted in the following areas, especially those that have not been covered in this study.

- The effect of climate on mathematics performance at KCPE
- Social-economic factors influencing performance in mathematics
- Similar study covering the whole district and more schools
- Research considering other factors rather than those addressed in this research project
- Research on how religion affects performance in mathematics
- Research on the same, but using different methodology of study
- Similar study be done in other ASAL districts so as to allow more realistic generalization of results
REFERENCES


Eshiwani, G.S. (1991); *The Kenya Teacher No. 3.* KLB, Nairobi.


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APPENDIX - A

INTRODUCTION LETTER TO QUESTIONNAIRES

Dear Head Teacher/Teacher/AEOs,

This questionnaire is meant for academic research based on education issue or problem. The title of my research is: Investigation into factors contributing to poor performance in mathematics at KCPE level in public primary schools in Isiolo District.

You have been selected as an appropriate respondent for the study. It is important that your responses are honest. Read carefully before giving your responses.

Your responses will be treated with strict confidentiality and used only for the research purposes.

Your cooperation will be highly appreciated.

Thank you.

Yours faithfully,

Kananu Susan
APPENDIX - B

HEAD TEACHERS’ QUESTIONNAIRE

Background Information

Name of School ____________________________________________
Sponsor __________________________________________________
Management ________________________________________________
Date of Registration ________________________________________
Province __________________________________________________
District ____________________________________________________
Division ____________________________________________________
Zone _______________________________________________________
Type of School ______________________________________________

QUESTIONS

1. Please indicate your highest academic and professional level in the spaces provided below:

   Academic ____________________________
   Professional ________________________

2. Indicate the number of years you have served as a teacher and as a head teacher in the spaces provided:

   As a teacher ___________________________
   As a head teacher _______________________

3. Please indicate your school’s KCPE performance over the least 3 years, in terms of mean score. Also show mathematics mean score, for those 3 years in the spaces provided.

   ____________
   ____________
4. Do you have a method of ascertaining whether teachers teach, give and mark mathematics assignment? Tick where appropriate. Yes ☐ No ☐

5. What methods do you use to ascertain whether teachers teach, give and mark assignment?


6. In your opinion, why do some schools perform poorly in mathematics while others perform extremely well, despite having similar resources? Give 3 reasons.

(i) 

(ii) 

(iii) 

7. Indicate the adequacy of the following facilities in your school. Tick ☑ only one.

<table>
<thead>
<tr>
<th>Facilities</th>
<th>Very adequate</th>
<th>Adequate</th>
<th>Inadequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textbooks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematical sets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics textbooks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise books</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching resources</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. In the table below indicate pupils’ enrollment per class:

<table>
<thead>
<tr>
<th>Classes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>S.T.</th>
<th>G.T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. In the table below indicate your teaching staff establishments:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Graduate</th>
<th>A.T.S.</th>
<th>S1</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>U.T.</th>
<th>S.T.</th>
<th>G.T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. What is the teacher/pupil ratio in your school? ____________________________

11. How is the home background of the majority of the children in your school? Tick one.

   Very Good  Good  Poor  Very Poor

12. What is the occupation of the majority of your parents? Tick one from the list below.

   (i) Peasant farmers
   (ii) Business people
   (iii) Employed as teachers, nurses e.t.c.
   (iv) Nomads

13. (i) Do your school have updated S.M.C.?

   Tick correct response: Yes ☐ No ☐
(ii) How often do the S.M.C. meet in a year? Tick correct answer.

a) Once  b) Twice  c) Thrice  d) Any time

14. In what ways do the S.M.C. support the learning of mathematics in your school?

(i) ____________________________________________

(ii) ____________________________________________

(iii) ____________________________________________

15. Mention at least two factors that affect the teaching of mathematics in your school.

________________________________________________

________________________________________________

16. Assess your students' attitudes towards mathematics. Is it; very positive, positive, negative, very negative? Tick one.

17. How often are your students assessed in mathematics? Daily, weekly, monthly or termly. Tick one.

18. Do you reward your students when they perform well in mathematics? Never, seldom, always. Tick one.


20. How often do your mathematics teachers complete the syllabus by the end of the year? Never, sometimes, always. Tick one.

Thank you for completing and returning this questionnaire.
APPENDIX - C

TEACHERS’ QUESTIONNAIRE

1. Please indicate with a tick your highest academic and professional level in the spaces provided below:

   Academic level ____________________________

   Professional level ____________________________

2. Indicate the number of years you have served as a teacher ____________________________

3. How old are you in this school? ____________________________

4. a) Have you ever attended further training / workshop / seminar in mathematics for the last five years?

   Yes [ ] No [ ]

   b) If yes state the type of training you attended

   (i) ____________________________

   (ii) ____________________________

   (iii) ____________________________

   c) If no, give reasons

   (i) ____________________________

   (ii) ____________________________

   (iii) ____________________________

5. What position do you hold in your school? Tick the correct response.

   (i) Deputy Head Teacher ____________________________

   (ii) Assistant Teacher ____________________________

   (iii) K.R.T. ____________________________

   (iv) Subject Panel Chairman / Secretary ____________________________
6. Mention at least three factors that affect the teaching of mathematics in your school.

(i) 

(ii) 

(iii) 

7. a) Do you prepare schemes of work and lesson plans? Tick the correct response.

Yes [ ] No [ ]

b) If yes, are they signed and stamped by the Head Teacher or Deputy?

Yes [ ] No [ ]

c) How often do you make them?

Tick the correct response.

(i) Termly

(ii) Yearly

(iii) Weekly

8. a) Do you have a testing policy in your school? Tick the correct response.

Yes [ ] No [ ]

b) If yes, how often do you give tests to pupils? Tick the appropriate answer.

(i) Weekly

(ii) Monthly

(iii) Termly

c) Do you keep pupils' progressive records for your class?

Yes [ ] No [ ]

9. How was your pupils' performance in 2004 KCPE examination in mathematics?

Good, Very Good, Poor, Very Poor. Tick one
Indicate appropriate percentage performance in relevant columns below.

<table>
<thead>
<tr>
<th>KCPE mark</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 99</td>
<td>-</td>
</tr>
<tr>
<td>100 - 199</td>
<td>-</td>
</tr>
<tr>
<td>200 - 299</td>
<td>-</td>
</tr>
<tr>
<td>300 - 399</td>
<td>-</td>
</tr>
<tr>
<td>400 - 499</td>
<td>-</td>
</tr>
</tbody>
</table>

10. In your opinion, specify reasons you attribute to students poor performance in mathematics. Give three reasons.

   (i) ____________________________________________
   
   (ii) __________________________________________
   
   (iii) __________________________________________

11. How often do you hold mathematics subject panel meetings in your school? Tick one.

   (a) Frequently
   
   (b) Often
   
   (c) Never

12. How often do you give pupils assignments?

   Daily, Weekly, Fortnightly. Tick one

13. Do you mark all the assignments that you give to pupils?

   Yes [ ] No [ ]

   If no, give one reason ____________________________________________

14. What is the teacher/pupil ratio in your class? ________________________
15. Indicate the adequacy of the following facilities in your school. Tick only one.

<table>
<thead>
<tr>
<th>Facilities</th>
<th>Very adequate</th>
<th>Adequate</th>
<th>Inadequate</th>
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<td></td>
</tr>
<tr>
<td>Desks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textbooks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T/L resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics textbooks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise books</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematical sets</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Assess the performance of your mathematics students. Is it; very good, good, average, poor, very poor? Tick one.

17. How is the home background of the majority of your pupils? Tick one.
   (a) Good
   (b) Poor
   (c) Very poor

18. Assess the attitude of your mathematics learners towards the subject. Is it, very positive, positive, negative, very negative? Tick one.

19. Do your learners often come for assistance in their mathematical problems?
   Never, rarely, sometimes, always. Tick one.


Thank you for completing and returning this questionnaire.
APPENDIX - D

PUPILS QUESTIONNAIRE

Answer the following questions carefully. Read the instructions for each question before giving the response. The information required is for an education research and I would assure you that the information given would be treated with a lot of confidentiality.

1. Your School Name ________________________________

2. Your Age ________________________________

3. Your Sex ________________________________ Male/Female

4. Your Class ________________________________

5. i) How many pupils are in your class ________________________________

   ii) Indicate the number of Boys and Girls in your class in the table below.

<table>
<thead>
<tr>
<th>Class</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Indicate your position and marks in your class in the last three terms in the table below.

<table>
<thead>
<tr>
<th>Term</th>
<th>Position</th>
<th>Marks</th>
<th>No. of pupils in your class</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>1st Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>2nd Term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>3rd Term</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. How many marks did you score in mathematics in last term’s test? _________ %
8. (i) How many days have you been absent from school this term?

________________ days.

(ii) What were your reasons for absence?

(a) ________________________________

(b) ________________________________

(c) ________________________________

9. Do teachers attend all mathematics lessons as per the timetable? (Tick one answer)

Yes [ ]  No [ ]

10. i) Do teachers give assignments in mathematics subject?

Yes [ ]  No [ ]

ii) If yes, do they mark the assignments?

Yes [ ]  No [ ]

11. How many desks and chairs are in your classroom?

(i) ________________________________ desks

(ii) ________________________________ chairs

12. In the table below, tick your mother’s and father’s occupation or work that he/she does.

<table>
<thead>
<tr>
<th>Mother’s Occupation</th>
<th>Tick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housewife</td>
<td></td>
</tr>
<tr>
<td>Peasant farmer</td>
<td></td>
</tr>
<tr>
<td>Business woman</td>
<td></td>
</tr>
<tr>
<td>Employed (teacher, nurse e.t.c.)</td>
<td></td>
</tr>
<tr>
<td>Nomad</td>
<td></td>
</tr>
</tbody>
</table>
13. a) Are there learning aids displayed in your class?  
Yes [ ] No [ ]  

b) If yes, name at least five which concerns mathematics in the spaces provided below (by their titles)  
(i)  
(ii)  
(iii)  
(iv)  
(v)  

14. How many pupils share a desk in your class?  
2, 3, 4, 5  
Tick the correct answer.  

15. What is the pupils/textbook ratio in your class? Tick one correct answer below.  
(a) 1:1  
(b) 1:2  
(c) 1:3  
(d) 1:4  

16. Should mathematics be made an optional subject? (Tick one)  
Yes [ ] No [ ]
17. Are you ever rewarded whenever you perform well in mathematics? (Tick one)
   Yes No Sometimes

18. Are you ever punished whenever you fail in mathematics tests or assignments?
   (Tick one)
   Yes No Sometimes

19. Do you always do your assignments on time? (Tick one)
   Yes No Sometimes

20. How often do you finish mathematics syllabus with your teachers? (Tick one)
   Always Sometimes Never

Thank you for completing and returning this questionnaire.
APPENDIX - E

QUESTIONNAIRE FOR AEOs

Particulars

Name of the Division

District

Division

QUESTIONS

1. Indicate the number of years you have served as an AEO in your Division in the
space provided

2. How many schools are in your Division?

3. Indicate the KCPE performance in your Division for the last 3 years as below:

<table>
<thead>
<tr>
<th>YEARS</th>
<th>MEAN SCORE</th>
<th>MATHS MEAN SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. (i) Do you have a method of ascertaining whether teachers in your Division give
and
mark mathematics assignments?

   Yes [ ]    No [ ]    Tick one

(ii) If yes, which method do you use?

   __________________________________________________________

   __________________________________________________________
5. How often do you visit schools within your Division?

Monthly, Termly, Yearly. Tick one

6. Are there adequate facilities and resources to enhance and facilitate the teaching and learning of mathematics in your schools? Comment

7. (i) In your opinion, what is the teachers and pupils attitude towards mathematics?

Teachers’ attitude

Pupils’ attitude

(ii) Why do you think most pupils perceive mathematics as a difficult subject?

Give two reasons

a.

b.

8. (i) In the table below, indicate pupil’s enrollment in your Division.

<table>
<thead>
<tr>
<th>Classes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(ii) In the table below, indicate your teaching staff establishment:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Graduate</th>
<th>ATS</th>
<th>S1</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>UT</th>
<th>ST</th>
<th>GT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. What is the teacher/pupil ration in your Division? __________________________

10. Mention at least two factors that you think affect negatively the teaching and
    learning of mathematics in your Division _________________________________

11. How often do mathematics teachers in your Division complete the syllabus by the
    end of the year? Never, Sometimes, Always. Tick one

12. Do you hold prize-giving days in your Division? Yes [ ] No [ ]
    Tick one

13. What social cultural factors affect adversely the teaching and learning of
    mathematics in your Division? Give two factors ________________________

14. (i) Are there mathematics teachers’ seminars/workshops held in your Division?
    Yes [ ] No [ ] Tick one

    (ii) If yes, how often are they held? Monthly, Termly, Yearly. Tick one

    (i) Do the schools’ inspectors and TAC tutors visit schools in your Division to
    assist them in mathematics difficulties? Yes [ ] No [ ] Tick one

    (ii) If yes, how often? Monthly, Termly, [ ] Tick one

    (iii) If no, give at least one reason ________________________________

Thank you for completing and returning this questionnaire.
APPENDIX - F
SAMPLE INTERVIEW SCHEDULE

1. Particulars of the respondents

Age _______________________________

Sex _______________________________

Designation _________________________

Place of residence __________________________

School’s name ________________________________

2. What position did your school take in the District in last year’s KCPE results analysis?

(a) Division position _________________________

(b) Zonal position ______________________________

3. What factors affect teaching and learning of mathematics in your school? Is it:

(a) Pupils’ absenteeism?

(b) Teachers’ absenteeism?

(c) Lack of teaching/learning resources?

(d) Poor administration?

(e) Lack of textbooks?

(f) Home background?

(g) Poor learning environment?

(h) Negative attitude towards mathematics?

(i) Mathematics is a difficult subject?

Tick any that affect the learning of mathematics.

4. i) What is the teachers’ attitude towards teaching of mathematics? Tick one.

Very Good  Good  Poor  Very Poor

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(ii) What is the pupils’ attitude towards learning mathematics? Tick one.

   Very Good    Good    Poor    Very Poor

5. What is the perception of pupils about mathematics as a subject? ______________________

6. How many mathematics homework are pupils given in a week?

   Very Many    Few    Very Few

7. Are all assignments given marked accordingly? ______________________________________

8. What is the class size of your school? _____________________________

9. Are the physical facilities e.g. desks, chairs, classes e.t.c. adequate in your school?
   ____________________________________________________________

   ____________________________________________________________

10. How does parents support their children in learning mathematics?
    ___________________________________________________________

    ___________________________________________________________

   ___________________________________________________________

11. Are mathematics’ teaching and learning materials such as textbooks adequate?
    __________________________________________________________

12. How often do teachers cover mathematics syllabus?

    Always    Never    Sometimes

13. Do pupils do enough revision in mathematics before they sit for the KCPE examination?

    Yes    No

14. Are teachers and pupils rewarded whenever they perform well in mathematics?

    Yes    No    Sometimes

15. How often are students punished for failing in mathematics test and assignments?

    Always    Never    Sometimes
16. (i) Which is your religion? Christianity, Islam. Tick one

(ii) How does your religion affect the teaching and learning of mathematics?
MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY

When replying please quote

Susan Benson Kananu
Kenyatta University
P.O. BOX 43844
NAIROBI

Dear Madam

RE: RESEARCH AUTHORIZATION

Please refer to your application for authority to carry out research on "Factors contributing to poor performance in Mathematics at KCPE I Public Primary Schools in Isiolo District". I am pleased to inform you that you have been authorised to conduct research in Isiolo District for a period ending 30th August, 2005.

You are advised to report to the District Commissioner and the District Education Officer Isiolo District before embarking on your research project.

It is noted that the research is a requirement in part fulfillment for the award of M.Ed Degree of Kenyatta University.

Upon completion of your research permit, you are expected to submit two copies of your research findings to this Office.

Yours faithfully

B. O. ADEWA
FOR: PERMANENT SECRETARY