TOPIC: A STUDY OF THE HEADTEACHERS' AND PRIMARY MATHEMATICS TEACHERS' PERCEPTIONS OF THE PROBLEMS OF TEACHING MATHEMATICS IN VOI DIVISION, TAITA-TAVETA DISTRICT

BY:

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT FOR THE DEGREE OF MASTER OF EDUCATION, KENYATTA UNIVERSITY
DECLARATION BY CANDIDATE

This project is my original work and has not been presented for a degree in any other University.

O.M. MAGANGA

DECLARATION BY UNIVERSITY SUPERVISOR

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Secondly, I would like to thank all those who assisted with ideas, advice and help in whatever form, whenever I approached them.

Thirdly, my sincere thanks go to my family for the encouragement and patience during the two years.

Finally, I would also like to thank all of the following District Education Officer, Assistant Education Officers (Voi), headteachers, teachers, TAC tutors and Inspectors in Voi Division for their assistance in this exercise. Last but not least, my classmates, Lecturers, Mrs. G. Kinyuru and Mrs. L. Waithaka for typing my work.
DEDICATION

This work is dedicated to my wife Damaris Wuganga, and my dearest friends, A. Wandigi, A. Majala, R. Maganga, D. Tole, A. Mwashemu and 'NIM', for their tremendous support and companionship.
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</tbody>
</table>
ABSTRACT

The purpose of the research was to investigate headteacher's and primary mathematics teachers' perception of the problems of teaching mathematics in upper primary classes of Voi Division, Taita-Taveta district.

Two questionnaires were used, one for headteachers and the second for teachers of mathematics in Upper primary, seven and eight. Twenty six teachers and Twenty three headteachers responded to the Questionnaires. the questions raised, it was envisaged would help focus on the problems and possible solutions that would help in the improvement of teaching mathematics in primary schools. It is to be noted that there are many other factors involved, but the research was limited to the areas touched upon. Teacher Advisory Centres' (TAC) tutors were interviewed.

The research revealed that the main problems perceived by headteachers and teachers were:

1. Lack of adequate textbooks

2. Negative attitude of pupils towards the subject.

3. Insufficient inservice programmes.
4. Poor language ability i.e. English, the language of Instruction.

5. Insufficient time allocated for the teaching of mathematics.

6. Ill-equipped Teacher Advisory Centres (TACs) rendering them incapable of effectively improving teacher quality.
1.0 INTRODUCTION

The place of mathematics in the school curriculum is very secure. We teach mathematics because of

1. Its use in everyday life.
2. It can be enjoyed.
3. Of its value as a subject in its own right.
4. Of its application to other subjects.

It is also recognized that the intellectual skills that underlie mathematical activity are useful even in non mathematical situations. Educators, parents, employers all agree that mathematics is a useful subject to include in any primary school curriculum. Mathematics is recognized as a basic knowledge of any educated citizen. Phenix, P.H. (1964: p. 71) puts mathematics under symbolics, in his Realms of meaning, representing one of the fundamental achievements of mankind.

In the present technological society, the role of basic mathematical knowledge cannot be over-emphasised. This age increasingly places demands for such skills as computation, estimating, problem-solving and an increased handling of graphs and quantitative data. The Cockroft Committee Report of (1982: 1) observed that:
"There can be no doubt that there is general agreement that every child should study mathematics at school; indeed, the study of mathematics is regarded by most people as being essential."

Mathematics is therefore a compulsory subject and an examination subject in the Kenya Primary School 8-year cycle.

Mathematics also receives heavy emphasis in the primary curriculum as can be seen below in the syllabuses for Kenya primary schools. The subject time allocation shows in standards 1-3 that there are 5 periods out of 40. Standard 4-5, 7 out of 46 and standard 6-8, 6 out of 50. Out of the 50 periods available in the upper primary mathematics and English enjoy the highest time allocation in the primary curriculum.

Despite this heavy emphasis on mathematics, performance has continued to be very poor in national examinations. Eshiwani (1979: 2) observed that:

"--- Mathematics standards have been falling over the last ten years, furthermore pupils show less commitment to mathematics. There is need to review not only what is taught in mathematics but most urgently how it is taught."
There has also been a lot of concern expressed by educational administrators, politicians and the general public on performance in mathematics. This is supported by: Mwangi (1986) who commented that:

"There has been an outcry from the government and the general public on the way students learn and perform in mathematics."

An analysis of the K.C.P.E. scores indicate that there has been consistently poor attainment in mathematics.

Table (i)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Mean Mark.</td>
<td>20.32</td>
<td>22.15</td>
<td>19.17</td>
<td>22.75</td>
</tr>
</tbody>
</table>


Ngala N.K. (Kenya Times; 31/Jan./90 p. 13) lamented that although Kilifi schools did very well in Kiswahili language they nevertheless perform very poorly in English, Mathematics and Science subjects. This is true of most parts of the country as far as the situation in mathematics goes.
### Table (ii)

#### National K.C.P.E. Performance Analysis Per Year

Mean Standard Scores in Percentage

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ENG</th>
<th>SWA</th>
<th>MATHS</th>
<th>SC./ AGRI.</th>
<th>GHCR</th>
<th>ACM</th>
<th>HOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>49.99</td>
<td>49.69</td>
<td>48.93</td>
<td>48.35</td>
<td>50.10</td>
<td>49.20</td>
<td>-</td>
</tr>
<tr>
<td>1987</td>
<td>52.25</td>
<td>50.24</td>
<td>40.64</td>
<td>34.78</td>
<td>49.86</td>
<td>47.06</td>
<td>-</td>
</tr>
<tr>
<td>1988</td>
<td>50.25</td>
<td>48.90</td>
<td>48.84</td>
<td>49.05</td>
<td>49.35</td>
<td>48.55</td>
<td>-</td>
</tr>
<tr>
<td>1989</td>
<td>50.25</td>
<td>49.55</td>
<td>49.07</td>
<td>48.74</td>
<td>49.66</td>
<td>48.88</td>
<td>56.7</td>
</tr>
</tbody>
</table>


Mathematics was poorly done nationally compared to the other subjects. In 1986, 1987, 1988, and 1989 for example mathematics is ranked fifth. This points to the fact that there are problems in the teaching and learning of mathematics.

A close look at science and agriculture in 1986 indicates that performance has been poor (6th position). It is important at this juncture to note, mathematics is a useful tool for learning science and the poor performance in mathematics may pose serious handicaps in the learning of science.
Looking at the performance in Taita-Taveta District of which Voi forms a Division, the situation is not impressive as the table below shows. Performance in Taita-Taveta District has been poor compared to other districts. For instance, it has been below the national mean of 50, in 1986, 1987, 1988, 1989, 1990.

Table (iii)

K.C.P.E. Analysis in Taita-Taveta

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Standard score</td>
<td>47.35</td>
<td>46.69</td>
<td>47.20</td>
<td>48.70</td>
<td>48.28</td>
</tr>
</tbody>
</table>


In 1986 for example, Nyandarua which was the top district had an average of 60.15 and Nairobi had 52.36 against Taita-Taveta (13th) with 47.35. Also in 1986, the averages for other subjects in Taita-Taveta District was as given in Table iv.
Table IV

<table>
<thead>
<tr>
<th>Subject</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiswahili</td>
<td>60.09</td>
</tr>
<tr>
<td>English</td>
<td>48.09</td>
</tr>
<tr>
<td>Art/H/Sc./Music</td>
<td>47.47</td>
</tr>
<tr>
<td>Maths</td>
<td>47.35</td>
</tr>
<tr>
<td>Science/Agr.</td>
<td>47.03</td>
</tr>
<tr>
<td>GHCR</td>
<td>45.58</td>
</tr>
</tbody>
</table>


In 1986, Mathematics was among the bottom three in the subject ranking, indicating that it is one of the subjects in which pupils performed poorly.


Looking at the table for the national exam, the highest mark for the subject was 50, while the lowest mark for the subject was 50. Overall, the other marks were substantially higher than the lowest mark.

In 1985, the performance in Mathematics was very low. This clearly indicates that the teaching and learning of Mathematics is not up to the desired standard. There are problems that need to be investigated and addressed to improve the teaching and learning of Mathematics.

The factors that affect the teaching and learning of mathematics are many and varied. Among them are gi,
If we look at the analysis of national results in mathematics for the years 1987 - 1990, in Table VI the situation is not impressive.

Table V

K.C.P.E. Analysis

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>National raw</td>
<td>23.57</td>
<td>20.32</td>
<td>22.15</td>
<td>19.17</td>
<td>22.75</td>
</tr>
<tr>
<td>Modal mark</td>
<td>19</td>
<td>13</td>
<td>16</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Highest mark</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>49</td>
<td>50</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>9.58</td>
<td>9.19</td>
<td>8.92</td>
<td>8.91</td>
<td>8.47</td>
</tr>
</tbody>
</table>


Looking at table VI, the national raw mean the have been very low. In 1989, this was particularly low. Overall, the other years did not record substantially higher levels. The modal mark has been especially low. This clearly indicates mathematics performance is disheartening. There are problems that need to be investigated with a view to improving the teaching and learning of mathematics. The factors that affect the teaching and learning of mathematics are many and varied. Among them will be,
teachers' qualifications with implications for teacher quality, inspection and supervision of teachers, availability of resources, schools administrative practices, teaching methods, evaluation practices etc.

Kenya National Examinations Council 8-4-4 KCPE Newsletter 1990, had the following information on the order of merit of all the Districts in the country.

In the National order of merit 1989 KCPE overall, Taita Taveta District was position 13, with a mean score of 358.17, mean score in maths of 48.70, versus a national mean of 50 points.

<table>
<thead>
<tr>
<th>Table VI</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>National Mean mark.</td>
<td>23.57</td>
<td>20.32</td>
<td>22.15</td>
</tr>
<tr>
<td>Modal mark</td>
<td>19</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Highest mark</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Performance has been fluctuating over the four years. The performance in 1989 is the poorest over the four years.

Performance in mathematics has been the poorest compared to that in other subjects at K.C.P.E. The situation is clearly illustrated if we look at some items in K.C.P.E. and focus on those who obtained the correct response.

In 1989 for example questions 14, 15 and 45 on arithmetic, were as follows:

Q.14: \[ 1.5 \times 3 - 2.4 \times 0.6 + 2.94 \]
\[ 72 \div 1.2 \]

A 0.02
B 0.54
C 0.7
D 1.0

Only 19.33% chose the correct response and 1.73% had no answer.

Q.15: The mean of six numbers is 5.5. Five of these numbers are 2, 4, 8, 4 and 10. What is the median of the six numbers?

A 4
B 4.5
C 5
D 5.5

Only 30.34% obtained the correct response. 0.93% had no answer.
Q.45: The figure below represents a flower garden. The diameter PQRS of the larger semi-circle is 28m. The diameter of the smaller semi-circle is 14cm. What is the perimeter of this garden?

A 66
B 80
C 146
D 231

28.52% obtained the correct response, 3.30% had no answer. From the above item the correct responses on these straightforward questions were extremely low. This points to the poor acquisition of mathematics concepts and related problem-solving situations. This is also to be seen if one looks at the National raw mean for the years 1986 to 1990 in table VI page 7.

It is therefore important to establish the causes of this unsatisfactory state of affairs in our schools. The performance is equally poor at the secondary school. This concern is further echoed by Mutunga et al (1987: 200) when he states that:

"The current trend is in favour of mathematics of practical value as reflected in the recent introduction of 8-4-4 education system"

Mathematics therefore needs to be taught well and satisfactorily if the 8-4-4 philosophy of self-reliance is to be realised.
Scope (1973:11) underscores the spirit of the 8-4-4 when he states that;

"Every person, on leaving school, should have clear ideas of number. He should understand the way number is applied to measures of all varieties, but most particularly to those physical concepts he meets with most frequently, length, volume, weight, area, density, temperature, speed, acceleration and pressure. His knowledge of such measures should not be just academic, but also practical so that he can estimate realistically employing the standard measures of the community. He should be able to use correctly, accurately and with understanding the four fundamental operations of addition, subtraction, multiplication and division as applied both to number and to measurement... He should be able to read and interpret graphs, diagrams and tables. He should above all be able to apply his knowledge of mathematics to a wider range of problems that continually recur in his everyday life."

This clearly demonstrates that there is an urgent need to investigate the causes of low attainment in mathematics, which occupies a central position in the curriculum.

1.1 STATEMENT OF THE PROBLEM

This study was intended to identify and analyse the problems encountered in the teaching of mathematics in Voi Division of Taita-Taveta District. The researcher felt strongly that the areas of analysis will help illuminate the problem areas that have a bearing on low attainment as observed in mathematics performance. It was the intention of the researcher also, to focus on whether headteachers and teachers share common views on what they perceive to be the problem areas as well as the solutions envisaged. It is
considered important by the researcher that, the headteachers' and teachers' opinions must be sought on the problems and solutions if unity of purpose in improvement strategies is to be achieved. There must be shared goals and strategies formulated if the teaching and learning situation is to improve.

Due to the poor performance seen in mathematics there was a need to investigate the problems encountered by teachers and headteachers, in the effective teaching of mathematics in Voi Division.

1.2 RESEARCH QUESTIONS

This research sought to answer the following questions;

1. What problems do teachers of mathematics encounter in the teaching of the primary school course?
2. What do headteachers perceive as the problems of teaching primary school mathematics?
3. What solutions do mathematics teachers propose?
4. What solutions do headteachers propose?
5. What are the areas of agreement between headteachers and teachers on the problems cited?
6. What are the areas of agreement between teachers and headteachers in the solutions proposed?
7. What role can headteachers play in the implementation of a successful mathematics curriculum?
1.3 RESEARCH OBJECTIVES

The purpose of this study was to investigate the following:

1. The problems teachers of mathematics encounter in the teaching of mathematics.
2. The opinion of headteachers on the problem of teaching mathematics in their schools.
3. Whether teachers are visited by inspectors.
4. Determine the professional help teachers get from inspectors when visited.
5. What help, if any, teachers obtain from Teachers Advisory Centres.
6. What help if any teachers get from headteachers.
7. The recommendations proposed by headteachers in improving performance in mathematics.
8. The recommendations proposed by teachers in improving performance in mathematics.
9. What inservice programmes teachers have attended.
10. The role of headteachers in the implementation of a successful mathematics curriculum.
11. The areas of agreement between headteachers and teachers on perceived problems as well as solutions proposed.
1.4 SIGNIFICANCE OF THE STUDY

The findings of this study sought to identify some of the problems facing mathematics teachers in primary school. The study also identified some of the solutions proposed by both headteachers and teachers in overcoming these problems.

The findings will therefore be useful to:

(1) Headteachers in their planning for instructional programmes in mathematics in their schools.
(2) Teachers in planning for instruction, evaluation and their improvement.
(3) Inspectors in improving upon their supervisory activities in schools.
(4) Headteachers and educational authorities in their administrative duties.
(5) To educational and curriculum planners.
(6) To the Kenya National Examinations Council.
(7) To the Teacher-trainers in training colleges.

1.5 LIMITATIONS OF THE STUDY

Due to financial and time constraints, a small sample was used in the study. The findings may there-
fore not lend themselves to generalisability to the wider population. Due to limitation in the time available, a pilot study was not carried out in order to improve on the instrument used. It is also to be noted that honest responses are not easy to obtain in this kind of survey.

1.6 ASSUMPTIONS OF THE STUDY

(1) Headteachers and teachers gave honest responses.

(2) That performance at KCPE is a useful indicator in mathematics achievement at the primary school.

(3) The teachers in the sample from the division are representative of the District and possibly the teachers and headteachers in the country.
1.7 DEFINITION OF TERMS

K.C.P.E.: Abbreviation for Kenya Certificate of Primary Education. This is an examination done at the end of the 8-year primary cycle in Kenya.

Professional Grade: This refers to the professional level of attainment by teachers e.g. P1, P2, P3, S1, A.T.S..

P1: This refers to 'Primary one' which is a professional grade certificate attained after two years of training in a Primary Teacher Training College.

P2 - Primary Two.

P3 - Primary Three.

P4 - Primary Four.

S1: This refers to 'Secondary one'. It used to be attained after three years of training in a teachers college for secondary schools.

ATS: Refers to 'Approved teacher status'. This is a promotional grade awarded after inspection by the Inspectorate.

Primary Mathematics: This is a course of study in mathematics spanning standards one to eight of the primary 8 year cycle.

Upper Primary: This refers to standards four to eight in the 8-year primary programme.

TAC: Teacher Advisory Centres were established in the educational zones to help improve primary teacher quality under the headship of a tutor, usually drawn from experienced and successful teachers.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 MATHEMATICS TEACHING

One of the important goals of teaching is to prepare the student to use the skills and knowledge he has learned and to prepare him to learn more about the subjects he has been taught.

Mager R.F., (1968:7), stated that;

"We teach or instruct because we hope that through our instruction the student will somehow be different than he was before instruction. We provide "learning experiences" with the intent that the student will then be a modified person -- in knowledge, in attitude, in belief, in skill."

It is therefore important that the student should among other things, develop a favourable attitude toward a given subject because this determines the extent to which he will put the knowledge gained to use. Nearly everyone holds opinions about what is or is not 'good' teaching, and given this reality, criterion standards that ensure fair play - to the institution, the teacher, and the students - are difficult to come by. A good teacher will be inspiring and concerned about students, an active scholar, efficient and organized professional, who is accessible to students and colleagues.
However it should be recognised as indicated by Ericksen S.C., (1984:ix); that;

"The demands on instruction change as society modifies and expands what it expects from higher education, as new resources for teaching become available, and as the criteria for evaluating the quality of instruction are sharpened."

The quality of education is largely dependent on the quality of instruction we provide in our classrooms. The art of teaching, at conventionally understood by the traditional teacher, is the act of disseminating information to the learners in the classroom. Gone, however, is the notion that the art of teaching is imparting knowledge to empty receptacles.

New methods and techniques of teaching coupled with research findings on how children learn, have been developed. The teacher must therefore adopt these new techniques to ensure efficient and effective use of resources to promote richer learning by the pupils. Johnson et al (1972:5) noted that;

To be creative in any art, one must have a broad background in technique, materials and experience ...

Similarly, the art of teaching mathematics requires a strong background in the subject, in techniques of presenting ideas and in the materials available."

It is therefore important, to note that the first requirement in successful teaching of mathematics is knowing mathematics. Another important point is an understanding and acceptance of students: their interests and needs, their difficulties and abilities and the ways they best learn mathematical concepts. The creative teacher must of necessity, motivate his students, he must communicate his knowledge to them, efficiently and meaningfully, and through the use of instructional aids guide them to discover ideas.

As Socrates, once said "the ideas must be hatched in the learners themselves and the teacher should only act as a midwife". Chauhan S.S., (1979: 12) quotes Burton's definition of teaching as;

"Teaching is the stimulation guidance, direction and encouragement of learning."

To be a successful teacher, one must always search for ways to make his instruction more meaningful. In addition, appropriate planning is very crucial. Schemes of work, lesson plans, teaching aids and evaluation programmes to be instituted, must all be carefully planned for. This should at all times take into consideration, the nature of the learner, the nature of the topic, the size of the class and the objective of the topic.
As Ericksen S.C., (1984:ix) noted;

"There is no consensus model of the ideal teacher, and the instructional diversity we see on every campus is a clear reminder that the individual teacher is the cook in charge of the kitchen."

A successful teacher will therefore need to have at his disposal, the whole range of teaching strategies and techniques to choose from as, the situation-specific will demand. In addition it is to be recognized that no single method is clearly superior, teachers, however, still cling to the traditional methods of instruction even today. As Mutunga et al (1987: 41) observed;

"For years, and far too often, instruction in mathematics has become barren, boring and uninspiring."

This situation has contributed to the development of poor pupil attitudes toward mathematics, resulting in poor performance and low attainment.

An evaluation study by the Kenya Institute of Education, (1984) indicated that the majority of teachers, did not use activity methods which are child-centered but used mainly traditional talk and chalk methods. It was also noted that very few teachers
used teaching aids. The quality of teaching is therefore an important element in the successful learning of mathematics. It has often been said that teachers who have a positive attitude toward mathematics, have a positive effect on their students' attitudes.

Anyona quoting Mwangi (1983: 21) found, teachers negative attitude towards mathematics resulted in pupils' poor performance in the subject. Many people however dismiss the problem of the primary mathematics teacher as, simply teaching how to add, subtract multiply and divided. This is however far from the truth. The first few years of the child's experience with mathematics are crucial in that they can affect the child's attitude to mathematics for the rest of his/her life. If a child does not reach a satisfactory understanding of the basic mathematical concepts taught in the primary school, there is little chance that, he will achieve success in the more advanced areas of the subject or even the basic concepts necessary and crucial in understanding their applications in other subjects or when tackling everyday life problems.

Teachers need to ask themselves firstly, Is it necessary that the children's desks should stay in exactly the same pattern in the classroom for the whole year? And secondly, whether it is necessary or
even desirable that all mathematics lessons should take place in the classroom?

In conclusion, emphasis in the teaching of mathematics should be on processes of mathematics and not products. As Bruner J. (1966: 72) noted on teaching:

"... To instruct someone in these disciplines is not a matter of getting him to commit results to mind. Rather, it is to teach him to participate in the process that makes possible the establishment of knowledge. We teach a subject not to produce little living libraries on that subject, but rather to get a student to think mathematically for himself, to consider matters as a historian does, to take part in the problems of knowledge - getting. Knowing is a process, not a product."

This is an important observation for the teacher as it puts the task of the teacher is sharp focus. The Cockcroft Report (1982: 71), noted:

"Mathematics teaching at all levels should include opportunities for exposition by the teacher; discussion between teacher and pupils and between pupils themselves; appropriate practical work; consolidation and practice of fundamental skills and routines; problem-solving including the application of mathematics to everyday situations, investigational work."

Anyona J.O. (1988:20) observed;

"The more the number of times the teacher
attends the inservice courses, the higher the probability that he will be more effective in his teaching."

It is important to note that teachers must be given continuing opportunities for learning. A single course of teacher training, however long it lasts and however excellent it may be, will not be sufficient to cope with the change that continually take place.

2.2 RESOURCES AND PHYSICAL FACILITIES

It is a truism that good teaching and a pleasant school atmosphere cannot be equated with the type of school facilities available. It is nevertheless important to note that the facilities in a school must meet some basic standards in order to ensure effective teaching and learning. The Kenya Journal of Education Vol. 4 No. 2 of (1989:111) noted that:

"Availability of books for reading and teaching aids are extremely important in enhancing teaching and learning process--- good teaching of any subject depends largely on the availability of suitable textbooks and teachers' guides."

It is generally felt that schools have a serious lack of textbooks, writing materials etc. This is evident throughout the country when one reads about the formation of "book funds" raised through harambees in different districts to provide basic textbooks.
Journal of Education Vol. 4 No. 2 of (1989:112) noted that:

"One important factor related to facilities that tends to affect teaching and learning is that of congestion. If children are overcrowded, in their sitting positions they experience difficulties in writing. Teachers will also find it very difficult to move round a crowded class. This means he will not be able to reach with ease all the children as they sit working in their places."

This poses a serious handicap for the teacher since he/she cannot adequately supervise practice sessions, provide for individual differences, cannot effectively and meaningfully mark pupils' work and provide the necessary feedback. Ng'ang'a F.M., (The Standard 15th Jan 1989 p. 3 Col. 2) concurs by noting that:

There is no way a teacher can handle more than 50 children in a class and produce effective results. We need one teacher to handle about 30 to 36 children."

This makes teaching very difficult resulting in frustration on the part of the teacher as well as the pupils. It is not uncommon to find 50 or more student in a class where 3 or 5 pupils have a single textbook! With the increasing trend for the teacher to become a "facilitator of learning" rather than the teacher of
'facts', there has been a need for teachers to incorporate teaching aids in their lessons. Digolo (1986:344) puts a case for the community resources, when he says that "Use of community resources encourages active participation of learners in lessons and use of familiar environments".

He notes that there is a shortage of suitable and adequate materials for instruction in the primary schools. He laments that primary schools do not make adequate use of community resources.

Digolo (1986:11) quotes Mbiti (1981) where he says that few are the cases where one would find teachers who have changed from the chalk and talk method or the drilling method in their teaching. Teaching Aids or any resources are only effective if they portray exactly what the teacher intends, that they are readily available and when they are attractive and interestingly presented for a specific objective which would otherwise not be possible. Expense should therefore not be the reason for lack of their use since one can find them in the environment. As Digolo (1986:XV) notes, Teacher Advisory Centres should play a leading role in the collection and dissemination of community resources to primary schools. Textbooks have been used exclusively by most teachers because to some teachers they represent the syllabus! The teacher as the single most important resource, should make use of both textbooks and Teaching Aids prudently. The study focuses on the Textbooks because as Mutunga (1986:234) says it is the most commonly used and that when properly written it determines the scope, sequence and pace of the mathematics programme. It does not however determine the mathematics curriculum.
It is observed that many schools are limited in resources such as library books, concrete and visual learning aids, community resources, duplicating machines and so the textbook provides the basic and sometimes the only resource. Johnson (1972:403) noted that;

"Audio visual aids are as essential for the mathematics teacher as spices are for the chef. They add variety, the depth and the breadth which make the learning process pleasant and meaningful."

If audio-visual and other learning materials and equipment are used properly, the result is more correct and richer learning, an economy of time and improved student retention. It is useful to always ask what unique contribution will this particular aid make toward better learning?

Teaching aids help pupils to clarify, coordinate and organize their ideas. The best equipment is however useless unless it is properly used.

The situation in Kenya was summarized in the following quotation, of Daily Nation November 7th 1985 p. 12 Col. 1;
"... Kinyanjui and Court also noted that the quality of education has been declining due to pressure on existing educational facilities which cannot cope with the ever increasing demand. Schools are overcrowded and may lack adequate teaching resources."

This clearly also relates to mathematics teaching. The place of resources in the teaching and learning process cannot be ignored. This encourages 'active learning in the primary school. Emphasis shifts from instruction by the teacher towards investigation by the children themselves. Classroom experience in many parts of the world has indicated that children learning by such means learn more thoroughly and with more enthusiasm, and that, in so doing, they develop confidence in their own powers. These methods benefit children of all ages and abilities.

2.0. Evaluation

Bloom (1971) characterised evaluation under two designations, formative and summative. Summative evaluation is the general assessment of students progress often associated with grades, and is the kind of evaluation that follows units or entire courses of instruction.

Formative evaluation on the other hand, is directed at the instructional process itself, planning, teaching and learning - for the purpose of improvement of the process. Most stress in schools
has been on summative evaluation, but every classroom teacher should give equal attention to formative testing. Frequently teachers go for the answers in mathematics, where too many red crosses discourage pupils. It is to be noted however that, written comments are more useful to students. Routine marking of exercises and homework is of no use if attempts are not made to diagnose misconceptions and other learning difficulties. A useful evaluation exercise must involve careful construction, administration and interpretation of results and measures obtained.

2.1. Examinations

Under pressure from parents, employers, administrators who consider it important to pass public examinations, some teachers narrowly concentrate on examination type of study, thereby teaching a complete but uninspiring mathematics course.

Public examinations like Kenya Certificate of Primary Education, should serve two purposes.

First to provide evidence that personal standards are being achieved and secondly to ensure that national standards are being maintained.

The isolated testing of individual, unrelated facts or bits and pieces of content has no place in
the evaluation programme. Testing must be linked to the instructional programme if it has to be relevant. Of necessity, evaluation and feedback for mathematics must be long term in nature and should be centred on the continued cognitive growth and development of the individual and his or her understanding of mathematics. The purposes of testing and evaluation is two fold; firstly to provide teachers with 'information' about progress and needs of pupils for who they are responsible, and to enable them to assess the effectiveness of their own planning and teaching. And secondly to enable pupils to know how they are progressing and to provide incentives to better performance.

The summative evaluation often determines the content and teaching style. A complete profile of attainment, however, is only possible through formative evaluation, this is more useful to the teacher. The K.C.P.E. has often been accused of poor testing and determining the content and methods of teaching. Often, teachers due to pressure cited earlier, have adopted drill methods, emphasis on memorization and the choice of only those examinable areas of content. The result has been uninteresting experiences, irrelevant to the children, leading to frustration and development of poor attitudes to mathematics. Callahan (1971: 751-755) observed that:
"Pupils' feelings are very important and has a strong effect upon the amount of work, the effort put forward and the learning that is acquired."

The implication of this is that positive attitudes are very important in the learning of mathematics.

Irumbi (1990:30) quoting Begle (1973: 207-214) observed that students attitudes towards mathematics is positive in the early years of primary schooling but a decline appears as they progress to upper classes. It is important for teachers to develop in the pupils a positive attitude and to sustain these favourable attitude to ensure high attainment in mathematics. Teaching for examination is therefore detrimental to good performance in mathematics, and often mathematics is presented in its finished form rather than focusing on relationships of concepts and the processes of mathematics.

Despite the detailed statement of objectives of the primary mathematics syllabus, schools have continued to lay great emphasis on the activities geared towards K.C.P.E. examinations. As noted in N.C.E.O.P report (1976

"The schools as they are today do not have the capability, time or even motivation to teach the values of society. This is because the school are geared entirely to the passing of formal examinations..."
This continues to be so, so much so that K.C.P.E. is an important single instrument that is used to measure pupil attainment and judge the quality of education at each school, by how well the pupils have performed. This tends to obscure other important aspects of learning.

2.3 THE MATHEMATICS CURRICULUM

The mathematics curriculum in this country is formulated by the Kenya Institute of Education, which is the research and curriculum development wing of the Ministry of Education. Several changes have occurred in the mathematics curriculum in this country. In the early sixties Kenya was not left behind when the modern Mathematics wave was sweeping through many countries. Some of the major problems faced at the time in the implementation of the modern mathematics curriculum, was lack of proper inservice courses for teachers, and lack of relevant and adequate teaching - learning materials, for instance, books. This new programme proved unpopular so much so that in 1981, there was a presidential directive to schools to revert to traditional mathematics which had been inherited at the time of independence. In 1985, with the introduction of a new system of education in the country (The 8-4-4), a new curriculum in
Mathematics based on the 8-4-4 philosophy was introduced.

All these changes have affected both content and methodology. It is very important to realise that, the single most important agent of change in a school system, is the classroom teacher. It should therefore be seen as an important step in the implementation of any innovation to inservice practising teachers. These teachers need to be involved in development of appropriate materials as well as in being updated on the latest developments in instructional techniques and educational technology. Another important point is the development of adequate facilities and resources such as textbooks, audio-visuals etc. There is also the need for evaluation through the inspectorate to provide advice to teachers constantly. It was with this in mind that, this study investigated the availability of resources, the inservicing of teachers and the inspection of the teaching and learning situation.

2.4 TEACHER TRAINING

It should frankly be admitted that the present day teaching and learning of mathematics is far from being satisfactory. Johnson et al (1972:97) observed that;
"Too often, instruction in mathematics classrooms is barren and uninspiring. The typical lesson is as follows. First of all, homework is discussed; then the teacher demonstrates a new procedure or theorem; then he assigns the next exercise - and class is dismissed. Such a procedure does little justice to the exciting content, varied instructional aids and emphasis on student participation of mathematics today."

This points to a lack of adequate training of teachers. Too often, teachers use methods that they themselves were taught in.

Servais et al (1971: 235) noted that;

"If the desired quality of mathematics teaching is to be maintained, if not improved, the vital problem is to train teachers in the content of mathematics and in teaching methods, and to keep abreast of new developments."

Primary school teachers have a complex task of teaching practically all subjects to children. In view however of the importance of mathematics, they must be able to teach it properly. Eshiwani (1979: 2) claimed that mathematics standards had been falling over the preceding ten years, furthermore pupils showed less commitment to mathematics. He also noted that there was need to review not only what is taught in mathematics but most urgently how it is taught. How it is taught relates to the training of
of teachers. Johnson et al (1972:5) notes that;

Most people are agreed that a first requirement for success in teaching mathematics is knowing mathematics."

Real satisfaction in teaching mathematics comes from the fact that we are teaching the subject we enjoy. This is however not the case in our situation. In a review, by the Kenya National Examinations Council of Teacher Trainee Examinations (1980:39) it was noted that;

"... it can be seen that students graduating from Teachers' Colleges have a number of serious problems in mathematics which will militate against effective teaching in our primary schools. About 40% of students enter college with a very weak academic background in mathematics. Many of these students are not even well versed in the basic algorithms and mathematical skills which they will be required to teach."

It has been the practice in colleges to recruit trainees some of whom with poor backgrounds in mathematics, train them for two years in all subjects and expect them to teach mathematics among other subjects. This has clearly led to a situation where a student teacher who dislikes mathematics is 'forced' to teach it. This clearly is counter productive.

On teaching strategies and methods, traditional methods still abound in our classrooms. These re-
quire the least amount of time for planning and less resources for teaching and are therefore preferred. The Kenya National Examinations Council report on Teachers' Examinations (1980:39) noted;

"... even those students whose mathematics background is good and who can perform well in questions involving problem-solving are often unaware of the methods and strategies which they can use to pass this knowledge and skills to primary children."

This is an indication that teacher training in methodology needs to be strengthened.

Inservice courses, refresher courses, workshops are essential ingredients in the professional growth of practising teachers. Chemunyan (1992:59) noted in his findings that in Kericho District upto 69.2% of respondents had not been inserviced after college. This is easily representative of the majority of teachers in the country. There is need to strengthen the pre-service training programmes and the inservice courses to keep teachers well versed in content and particularly in new and appropriate techniques in methodology.

It should be noted that mathematics teachers with an inadequate background in mathematics and in the methods of teaching, resort to the textbook (albeit a poor one) as a substitute for this back-
ground they lack and adopt the methods that their
teachers used. On techniques of teaching and their
development, Prince Philip, in his message to the
second International Congress on Mathematical Educa-
tion held in London (1973:v) noted that;

"Those fortunate beings who find mathe-
matics a joy and a fascination will
probably get on, whatever the standard
of teaching. It requires real genius
to light a flicker of understanding in
the minds of those to who mathematics
is a clouded mystery. The subject is so
vitaly important for everyone in this
technological age that any advance in the
techniques of teaching is to be welcomed."

It is one thing to know the content but quite another
to be able to successfully communicate it to others.
Teachers must therefore be trained in both content
and methodology and constantly be inserviced for
improvement.

An interesting observation was made in the
Report by the mathematics subcommittee, Kenya
Institute of Education (1978:28) where it was
observed that;

"Part of the problem is that primary
teaching does not rank highly in the
careers preference hierarchy of most
Those with the best mathematics grades
tend to take up opportunities in
further education or in pre-service
training opportunities in fields such as agriculture, water development, or medical services. In this way a vicious circle tends to be created: the teaching profession fails to attract enough recruits with mathematical talent; hence the quality of mathematical education received by the new generation of pupils is likely to be inadequate; hence the output of school leavers with good grades in mathematics is likely to continue to be insufficient."

Presently the minimum requirement for preservice training is an average grade of D-. These are candidates who are towards the bottom category in performance and therefore unlikely to have any good grades in mathematics. It is important that teachers trainees must have a good mathematical background as well as commitment to the profession.

2.5 LANGUAGE

"In Kenya, English and Kiswahili have the status of national languages and these and about fourteen other languages are used for primary school instruction." (Wasambo - Were 1986).

In standard IV - VIII, English is the medium of instruction. Headmasters, school inspectors, the Ministry of Education, and most parents expect their students will be taught in English exclusively from standard IV so that they have a better chance to succeed in the school leaving examination.

There are however, considerable language difficulties
in the learning of mathematics. Even in a country where children are fortunate enough to learn mathematics in their mother tongue throughout their school days and where the mother tongue is a foreign language, well adapted to the expression of mathematical ideas. When they first enter school, the linguistic skills of many children in Kenya, are insufficiently developed to enable them to join in conversation that have a mathematical content. The school must therefore work to build up the children's concepts and vocabulary. Primary school pupils in a majority of schools especially in the rural areas experience great difficulties in learning mathematics in a second language. The inability of children to solve problems that involve translation into mathematical language is evident in most schools. Research evidence seems to indicate that if the language of instruction is English, then children whose mother tongue is not English are at a disadvantage compared to those for whom English is the first language.

Hugh Hawes (1979:76) note that;

"Competence in English is an unquestioned asset both for learning and in employment."
He further observes that in some subjects and topics, particularly Maths and Science, English Language embodies western thought patterns and there is a risk that translation may lead to fundamental misunderstanding. Teachers must therefore be trained to encourage pupils to verbalise their thoughts in order to clarify their thinking as well as help the teacher to diagnose misconceptions, errors and mistakes for corrective actions to be instituted.

Language used in mathematics lesson is often technical, sometimes needlessly so. As the mathematics sub-committee, Kenya Institute of Education noted in July 1978;

"The use of vigorous mathematical language is not necessary for the development of effective concepts. On the contrary, exact use of language and clarity of meaning are often incompatible, especially for pupils who are still in the early stages of learning the subject."

The use therefore of formal language divorces the study of mathematics from anything the child is likely to experience outside the classroom, where often communication is not carried out in English. This creates problems to teachers and pupils in using a second language. Misconceptions leading to distortion of facts, concepts, result in bewilderment,
frustration, embarrassment, disappointment and anxiety feelings in children. The limited competence in English of most primary school pupils must be taken into consideration when developing concepts.

The problem of transfer of meaning has considerable difficulties for example, from three o'clock in English to the Kenya situation of Swahili or most of the local languages of 'saa tatu'!

To illustrate this further, the concept of sharing in our situation means that, two people sharing anything, each gets the same amount. It would be confusing therefore to talk about, for instance, two people shared ten oranges such that one had 4 more than the other. If they share, then each should get 5!

Morris (1984:19), makes a valid point when he states that "When the language of schooling from the beginning of the primary school is a second language, there is less possibility of developing mathematical ideas through informal oral language before the written language and mathematical symbols are introduced. It is vitally necessary that the language teaching should be designed in collaboration with the mathematics teachings so that language is available to express mathematical concepts as they are developed".

Kenyan children are therefore likely to be disadvantaged as most of them exhibit a serious handicap in English competence which is the language of instruction and examination
There is need therefore to reexamine the language used and to investigate children's understanding very thoroughly.

2.6 SCHOOL ADMINISTRATIVE PRACTICES

Administration is an integral part of any organisation such as a school; aimed at maintaining and expanding the relevance, effectiveness and productivity of the organization. Among the duties of the school head are:

1. To ensure effective attendance to duty by his staff.

2. To motivate his staff to ensure quality performance.

3. To ensure the acquisition of resources and ensure their prudent use.

4. To ensure that the laid down syllabus is followed.

5. To ensure teachers' schemes of work, lesson plans, records of work and effective evaluation procedures are kept.
(6) To advise both teachers and pupils on personal and professional matters.

(7) To set standards of excellence and ensure that these are maintained.

(8) To set worthwhile and achievable goals.

Waters (1983:127) observed that;

"The head is accountable for what other people in the school do, and carries responsibility for all decisions taken. Sometimes the headteacher and assistant teachers are unaware of the extent of this responsibility. It is only in recent years that headteachers have been questioned about purpose, priorities efficiency and quality and made to think more deeply about their roles, and the way in which they work."

The headteacher has the responsibility for the situation in his school. Essentially he has to work with people and through them to make things happen. He is concerned about how various people involved are related to each other, what tasks are assigned; how efforts are stimulated, controlled and unified and what material resources must be procured and utilized in the pursuit of school goals. He needs to also carry out appraisal activities that is seeking to establish standards for evaluation and determining how well standards are being achieved.
Waters (1983: 127-128) noted that some of the duties of heads include:

(1) Motivating staff

(2) Determining appropriate standard of work and ways to monitor activities.

(3) Ensuring a fair allocation of resources throughout the school, and their careful and efficient use.

(4) Devising appropriate means of controlling and disciplining the children.

(5) Building of morale and creating an atmosphere in which teachers and children work purposefully and happily together.

(6) Coordinating and supervising the work of the school.

(7) Taking account of changing circumstances to initiate new ideas and encourage development in curriculum content and methodology.

(8) Above all set up an effective administrative system to serve the needs of the school.

The head therefore determines the quality of instruction and pupil achievement in his school.

As noted by Hughes (1977).
"Heads of schools and principals of colleges usually have had substantial teaching experience. They therefore have some justification for claiming credibility as educational leaders both within their own system and as representatives of that organization in the wider world."

This clearly indicates that heads have a responsibility and the capacity to improve school performance by offering effective instructional, administrative and professional leadership. To achieve this they need to encourage consultation and participation by all staff in identifying common goals and strategies that all will support.

Waters (1983: 136) noted that;

"Leadership is about developing a sense of purpose and comradeship. This cannot be done by fear. The aim is to create a team of competent professionals, not a group of frightened teachers."

The head must encourage, and promote trust, provide for recognition of good performance and be exemplary to others. The role of the headteacher in school is very crucial as was noted by the U.S. Senate (1979:)

"If a school is vibrant, innovative, child-centred place, if it has a reputation for excellence in teaching, if students are performing to the best of their ability, one can almost always point to the principals"
leadership as the key to success."

The head therefore can and should play a crucial and decisive role in the improvement of the teaching of all subjects and especially mathematics.

Teachers' morale is influenced by effective administration. A school in which good morale prevails is likely to have much less disciplinary problems among teachers and pupils. Teachers in such a school are likely to be much more committed and would therefore do their best for the good of the school.

Effective teaching of mathematics is contingent on several factors. The areas under review, it is hoped will illuminate on some of the factors that have perhaps led to the low attainment and poor performance in mathematics.

Successful teaching of mathematics demands therefore that proper teaching methods are acquired, physical resources as well as teaching resources are available, that language is well developed to help in concept development and that proper pupil attitudes are developed in addition to conducive administrative practices.
CHAPTER THREE

3.0 METHODOLOGY

3.1 INTRODUCTION

The data required for this research was obtained from primary schools in Voi Division of Taita-Taveta District. The respondents in this study were standard seven and standard eight mathematics teachers and head-teachers of the schools. There were 26 responses from teachers and 23 responses from headteachers that were received.

3.2 SAMPLE

Voi Division of Taita-Taveta district is a fairly extensive area with 52 schools and comprises 4 educational zones. Upper primary mathematics teachers were chosen on the basis that at this level pupils will have formed relatively discernible attitudes towards mathematics and that the language of instruction and examination is English.

Schools were randomly selected in order to avoid bias. A selected sample of upper primary teachers was used for the reasons cited earlier.

The selection process was as follows: Pieces of paper, containing names of schools were mixed thoroughly in a box. A total of 30 schools were picked. All the teachers, minimum of 30, teaching mathematics, Std.7 and 8, in these schools were selected. Some schools however could not be reached due to banditry and poor transport infrastructure in the zone.
3.3 RESEARCH INSTRUMENTS

The main research instruments were questionnaires. Two questionnaires were used, one for headteachers and the other for upper primary mathematics teachers.

The use of questionnaire was chosen due to the time factor, financial constraints and in the hope that information would be obtained quickly.

The questionnaires were in two parts. Part One sought general information about the respondents. It covered such areas as teacher's sex, professional and academic qualifications, teaching experience, whether trained or not etc. Part Two dwelt on the programme of teaching, covering such areas as, problems with facilities and resources, teaching methods, supervisory and administrative practices, evaluation, inspection, etc. An informal interview with TAC tutors was conducted.

3.4 PROCEDURE FOR DATA COLLECTION

After obtaining authority to collect data from relevant authorities, the researcher personally visited the selected schools. He administered the questionnaires to the respondents. The researcher explained the purpose for the data collection and gave the respondents the assurance that it would be treated with the utmost confidentiality.
The data collected will be treated using simple statistical methods i.e. calculation of percentages for purposes of interpretation.

Responses from the two questionnaires administered were tabulated and the corresponding percentages were worked out. Comparisons were then made in respect of these percentages. Information obtained from the interview with Teacher Advisory Centre tutors was returned by six teachers and twenty three headteachers responded.

4. GENERAL INFORMATION ON RESPONDENTS

<table>
<thead>
<tr>
<th>Gender</th>
<th>Teachers</th>
<th>Headteachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>No. 17</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>95.7</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>No. 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
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<td>24</td>
</tr>
<tr>
<td></td>
<td>4.3</td>
<td>3.8</td>
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</tbody>
</table>

The table indicates a strong bias towards males i.e. at 95.7% of headteachers and mathematics teachers respectively are male.
CHAPTER FOUR

DATA ANALYSIS

4.0 INTRODUCTION

This was a survey that sought information on Headteachers' and Mathematics teachers' perceptions of the problems of teaching mathematics. Responses from the two questionnaires administered were tabulated and their corresponding percentages were worked out. Comparisons were then made on the basis of these percentages. Information obtained from the interview with Teacher Advisory Centre tutors was recorded. Twenty six teachers and twenty three headteachers responded.

4.1 GENERAL INFORMATION ON RESPONDENTS

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td><strong>No.</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>95.7</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>4.3</td>
</tr>
</tbody>
</table>

The table indicates a strong bias towards males i.e. 95.7% and 96.2% of headteachers and mathematics teachers respectively are male.
**Academic Qualifications of the Respondents**

Table 4.1 (ii)

<table>
<thead>
<tr>
<th></th>
<th>Form 2</th>
<th>Form 4</th>
<th>Form 6</th>
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<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Headteacher</td>
<td>0</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Teacher</td>
<td>2</td>
<td>7.7</td>
<td>22</td>
</tr>
</tbody>
</table>

78.3% and 84.6% of heads and teachers respectively are form four graduates. While 21.7% and 7.7% are form six graduates.

**Professional Qualifications**

Table 4.1 (iii)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>P1</td>
<td>19</td>
<td>82.6</td>
</tr>
<tr>
<td>S1</td>
<td>4</td>
<td>17.4</td>
</tr>
</tbody>
</table>

This indicates both headteachers and upper primary teachers of mathematics are trained with 82.6% and 88.5% of heads and teachers respectively being P.1s while 17.4% of heads and 11.5% of teachers are S.1s. One teacher said he was P.1 from the In-service training programme.
4.2 INFORMATION ON THE PROCESS OF TEACHING MATHEMATICS

Adequacy of Teaching Periods

Table 4.2 (i)

<table>
<thead>
<tr>
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<th></th>
<th>Teachers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>5</td>
<td>21.7</td>
<td>4</td>
<td>15.4</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
<td>78.3</td>
<td>22</td>
<td>84.6</td>
</tr>
</tbody>
</table>

78.3% and 84.6% of heads and teachers respectively, indicated that the teaching periods were not adequate. On number of periods they would recommend, both groups agreed on an average of 9 periods per week.

Appropriateness of the Syllabus

Table 4.2 (ii)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th></th>
<th>Teachers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>60.9</td>
<td>17</td>
<td>65.4</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>39.1</td>
<td>6</td>
<td>34.6</td>
</tr>
</tbody>
</table>

60.9% and 65.4% of heads and teachers agree that the syllabus is appropriate. While 39.1% and 34.6% indicated the syllabus was inappropriate.
On Commitment of Teachers

91.3% of the teachers were thought to be committed while 8.7% were not committed. 82.6% of the teachers were interested in mathematics while 17.4% were not.

Attitude of Pupils

Table 4.2 (iii)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Interested</td>
<td>12</td>
<td>52.2</td>
</tr>
<tr>
<td>Not Interested</td>
<td>11</td>
<td>47.8</td>
</tr>
</tbody>
</table>

52.2% and 69.6% of heads and teachers respectively indicated that pupils were interested in mathematics while 47.8% and 30.4% of heads and teachers in that order thought pupils were not interested in mathematics.

Adequacy of Textbooks

Table 4.2 (iv)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>17.4</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>82.6</td>
</tr>
</tbody>
</table>

The table indicates that 82.6% and 76.9% of heads and teachers in that order agreed that the textbooks were not adequate.
Language as a handicap in Learning Maths

Table 4.2 (v)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Very Serious</td>
<td>13</td>
<td>56.5</td>
</tr>
<tr>
<td>Serious</td>
<td>10</td>
<td>43.5</td>
</tr>
<tr>
<td>Not Serious</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The results tabulated in table 4.2(v) were responses to the item on whether language was a handicap in learning mathematics. The table shows that 56.5% and 43.5% of the heads indicated the problem was very serious and serious in that order. All the teachers thought the problem was very serious.

Respondents Perception of the Teaching Load

Table 4.2(vi)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Overloaded</td>
<td>18</td>
<td>78.3</td>
</tr>
<tr>
<td>Not Overloaded</td>
<td>5</td>
<td>22.7</td>
</tr>
</tbody>
</table>

The table shows that 78.3% and 61.5% of heads and teachers respectively agree that teaching was overloaded.
Frequency of Checking Schemes of Work by Headteachers

Table 4.2(vii)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Regularly</td>
<td>20</td>
<td>86.9</td>
</tr>
<tr>
<td>Rarely</td>
<td>3</td>
<td>13.1</td>
</tr>
</tbody>
</table>

86.9% and 84.6% of heads and teachers in that order agree schemes are regularly checked.

On lesson plans this item appeared only in the teachers' questionnaire and 80.8% had their lesson plans regularly checked by headteachers. 92.3% of the teachers found the comments made useful. All teachers agree their headteachers were supportive. 80.8% of teachers indicated that they met regularly with heads to discuss the teaching of mathematics. 76.9% of the teachers also indicated that they met as subject teachers to review the teaching of the subject.

Influence of K.C.P.E. on Mathematics Learning

Table 4.2(viii)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Positively</td>
<td>10</td>
<td>43.5</td>
</tr>
<tr>
<td>Negatively</td>
<td>8</td>
<td>34.8</td>
</tr>
<tr>
<td>No Influencing</td>
<td>5</td>
<td>21.7</td>
</tr>
</tbody>
</table>
43.5% of the heads and 42.3% of teachers indicated that the examination K.C.P.E. had a positive influence on the learning of mathematics. On the other hand 34.8% and 38.5% of the heads and teachers respectively thought that K.C.P.E. had a negative influence.

**Inspection**

**Table 4.2(ix)**

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regularly</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Periodically</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Useful</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Not Useful</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

The table shows that 34.8% of the heads and in contrast 96.2% of the teachers had regular visits by the inspectorate. This discrepancy would be because when Inspectors visit teachers it is as if no visit to the school is indicated as no accounts etc. are checked during such visits.

86.9% of the heads and 84.6% of the teachers indicated that the comments made were useful to them professionally. Perhaps heads do not include visits to teachers as visits for school inspection.
Inservice of Teachers Since the Introduction of 8-4-4

(7) 26.9% of the Teachers indicated that they were inserviced while 73.1% of the teachers said they had rarely been inserviced since 1985.

Usefulness of Teacher Advisory Centres (TACs)

When asked whether Teacher Advisory Centres were useful or not useful, the information obtained was as follows:

Table 4.2(x)

<table>
<thead>
<tr>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Useful</td>
<td>16</td>
</tr>
<tr>
<td>Not Useful</td>
<td>7</td>
</tr>
</tbody>
</table>

69.6% of the headteachers indicated TACs were useful while only 34.6% of the teachers agreed. 65.40% of Teachers said that Teachers Advisory Centres were not useful.

Specialisation in Teacher Training Colleges

One item requested views on specialization in the subjects of trainees choice. The information obtained was as given in table 4.13
Table 4.2 (xi)

<table>
<thead>
<tr>
<th></th>
<th>Headteachers</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>73.9%</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>26.1%</td>
</tr>
</tbody>
</table>

73.9% of the headteachers and 88.5% of teachers agreed that teacher trainees should specialize in the subjects of their choice.

When asked to list five major problems of teaching primary mathematics, headteachers and teachers ranked them as follows.

**Headteachers**

(1) Lack of textbooks.
(2) Lack of teaching/learning aids.
(3) Poor attitude of pupils.
(4) Language difficulties.
(5) Lack of interested personnel.

**Teachers**

(1) Lack of textbooks.
(2) Lack of teaching and learning aids.
(3) Language difficulties.
(4) Inadequate time for mathematics.
(5) Poor attitude of pupils.
The solutions proposed were as follows:

**Headteachers**

1. Provision of adequate textbooks.
2. Increase in time allocated to maths.
3. Teachers to specialize.
4. Regular inservicing of teachers.
5. Greater use of teaching aids, and better equipped Teacher Advisory Centres.

**Teachers**

1. Specialization by teachers.
2. Provision of adequate textbooks.
3. Increase in time allocated.
4. Improve language ability.
5. Greater use of teaching aid with assistance from equipped Teacher Advisory Centres.
CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

INTRODUCTION
This study was conducted in Voi Division using schools from four educational zones. Upper primary mathematics teachers and headteachers were involved.

The purpose was to identify the problems of teaching mathematics in primary schools.

The following is a summary of the findings, the conclusions and recommendations for further study.

5.1 SUMMARY OF THE FINDINGS
From the responses in the questionnaires, the investigator came up with the following summary of the findings.

(1) There is a strong bias towards male that teach upper primary mathematics as well as those that are headteachers. Only one headteacher (4.3%) was female in the study.

(2) All the teachers were trained except one who was still undergoing the Inservice training programme. 78.3% of heads were form four graduates while 84.6% of the teachers were form four graduates. This represents satisfactory academic standards for the teachers capable therefore of handling primary teaching competently. 78.3% of the head-
teachers and 84.6% of the teachers indicated that the time allocated to mathematics teaching is inadequate and the number of periods should therefore be increased. Both groups recommended an average of 9 teaching periods per week for mathematics.

(3) On appropriateness of the syllabus, 60.9% and 65.4% of heads and teachers respectively agreed that the syllabus was appropriate, however, 39.1% and 34.6% disagreed.

(4) 91.3% of the headteachers indicated that teachers were committed while 82.6% indicated that teachers were interested in teaching mathematics.

(5) On the question of pupils' attitude to mathematics, 52.2% of heads and 69.6% of teachers agreed that pupils were interested. However, 47.8% of the heads and 30.4% of the teachers indicated that pupils had a negative attitude towards mathematics.

(6) Textbooks has been an issue in many schools in the country. 82.6% and 76.9% of headteachers and teachers respectively agree that they did not have adequate textbooks.

(7) Language was seen as a serious handicap in the learning of mathematics where 56.5% of the head-
teachers said it was a very serious problem with 43.5% saying it was serious.

All the teachers who responded indicated that language was a serious problem in the learning of mathematics.

(8) 78.3% of the headteachers and 61.5% of the teachers agreed that their teaching was overloaded.

(9) On the checking of schemes of work, 86.9% of the heads and 84.6% of teachers agreed that schemes were regularly checked.

(10) 80.8% of teachers indicated their lesson plans were regularly checked by headteachers. 92.3% thought the comments made by the headteachers were useful professionally. 76.9% of the teachers indicated that they met regularly as subject panels to review the teaching of mathematics.

(11) On the influence of K.C.P.E., 43.5% of heads and 42.3% of the teachers said, it has a positive influence however 34.8% of heads and 38.5% of the teachers thought it had a negative influence on mathematics learning!

(12) 34.8% of the heads and 96.2% of the teachers said there was regular inspection. 86.9% and 84.6% of heads and teachers respectively, indicated that the comments made were useful.
(13) 73.1% of teachers said they had rarely been inserviced since the introduction of the 8-4-4 in 1985.

(14) 30.4% of headteachers and a significant 65.4% of teachers indicated that Teacher Advisory Centres were not useful to them.

(15) 73.9% of headteachers and 88.5% of teachers agreed that teacher trainees in colleges should specialise in the subjects of their choice.

5.2.0 Discussions and Conclusions of the Findings

The study sought to reveal some of the problems encountered by teachers in the teaching of primary mathematics. The professional and academic qualifications of the teachers and headteachers were found to be very satisfactory. This will enable them to handle primary teaching competently.

5.2.1 Adequacy of Teaching Periods

Teachers have frequently complained that the syllabus was too wide prompting the ministry to review the syllabuses recently. There is general agreement by headteachers and teachers i.e. 78.3% and 84.6% respectively, that the time is inadequate to cover the syllabus meaningfully. What has happened is that some topics were simply missed out. The Syndrome of determining the popular K.C.P.E. topics set and then
teaching for examination has been the outcome. There should therefore be more time allocated to the teaching of mathematics, as the subject demands regular practice and more time to develop concepts and show their relationships as applied to problem-solving situations. The headteachers' and teachers' recommendations of nine (9) periods per week therefore seems reasonable.

5.2.2 Appropriateness of The Syllabus

The Ministry of Education has set in motion machinery to review both the number of subjects under the 8-4-4 system as well as the syllabi. This is a welcome move as significant number of both headteachers (39.1%) and teachers (34.6) indicated that the syllabus was inappropriate. The general feeling has been that the syllabus was too wide and overcrowded in relation to the time available. The syllabus should therefore be carefully reviewed with greater attention being paid to what the classroom teachers have to say.

5.2.3 Attitude of Pupils

As pointed out earlier, when the teaching of mathematics suffers from inadequate materials for teaching and learning, combined with disinterested teachers, the experiences in mathematics classrooms becomes barren and uninteresting. Poor attitude of teachers has according to literature been found to be
contagious. Pupils will learn better with more enthusiasm if they are interested in the subject.

47.8% and 30.4% of Headteachers and teachers respectively agree that pupils have a negative attitude to mathematics. The necessary steps should be taken starting with provision of interested and qualified teachers, textbooks and regular inservicing in relation to new methodology in order to improve on the pupils attitude. Pupils should not only be encouraged to do well in mathematics, they should also develop interest to continue learning and explore mathematical concepts and ideas.

5.2.4 On Teachers' and Headteachers' Perception of the Problems Encountered

Headteachers ranked the problems as follows in order of seriousness.

(1) Lack of textbooks for teaching and learning.
(2) Lack of teaching aids in teaching the subject.
(3) Poor command of the language of instruction.
(4) Poor attitude of the pupils towards mathematics.
(5) Lack of personnel with the right attitude towards the subject.

Teachers on the other hand ranked the problems as follows:
(1) Lack of textbooks for teaching and learning the subject.
(2) Lack of teaching aids.
(3) Poor command of the language of instruction.
(4) Inadequate time for mathematics teaching.
(5) Poor attitude of pupils towards the subject.

There is general agreement on the problems involved. Lack of adequate textbooks and teaching aids are ranked first and second by both headteachers and teachers. Poor attitude is ranked third by headteachers and fifth by teachers. Language handicap is ranked 4th by headteachers and third by teachers. Headteachers rated lack of interested teachers last while inadequate time for covering the syllabus was rated fourth by teachers.

The solutions to these problems range from provision of adequate textbooks, increase in the time allocated to the teaching of mathematics, specialization by teachers in the subjects of their choice, to improvement in the language abilities of the children. It is important to note the agreement between heads and teachers.

5.2.5 On the Interview with TAC Tutors

A significant 65.4% of teachers agree that they do not benefit from Teacher Advisory Centres. Anyona (1988:19) quoting Ayot said that the more the assistance the teacher gets from teacher Advisory
Centres the higher the probability that he/she will improve the teaching methods. Since the aim of these centres was to improve teacher quality, the results of the study paint a different picture. Upon the interview results it was established that TAC tutors face serious handicaps in achieving their objectives. One major handicap is lack of transportation. They are usually called upon to use their own transport to make follow-up trips to schools scattered over a large area often with poor transport. They also face a serious lack of basic office facilities such as typewriters for making reports, and lack of materials for improvisation of teaching materials. For the TAC tutors to function effectively and achieve their objectives, adequate facilities need to be urgently provided ranging from office space, assistant, reference books, funds and perhaps a motor bike for ease of movement. There should also be a deliberate effort on the part of the relevant ministry to liaise with non-governmental organisations to facilitate seminars and inservice programmes for TAC tutors as well as in the provision of basic facilities cited earlier. TAC tutors should also provide leadership in the identification, dissemination and utilization of community resources as recommended by Digolo (1986).

5.2.6 Supervision by Inspectorate and Headteacher

The inspectorate is the ministry's arm that
ensures quality teaching and maintenance of acceptable standards in schools. It is apparent that they need to do more. Inservice programmes should be planned for regularly and not just when there is a change in syllabus or when problems crop up or even when there is a change in the education system. Constant inspection in the right spirit of partnership and sharing of ideas and provision of leadership are essential features. As for headteachers, leadership should be provided in identifying school goals and setting up an enthusiastic team to reach these goals. Ritualistic checking of schemes of work, lesson plans without professional guidance in relation to standards to be achieved is clearly futile. Heads need to ensure that teaching responsibilities are carried out effectively by building up morale through effective co-ordination and supervision. Appropriate standards of teaching and academic achievement should be emphasised.

It has often been said that teachers teach mathematics because they have to and if they had a free choice they would prefer not to teach it. 75% of headteachers and 85.7% of teachers agree that there should be specialization. Headteachers have to carefully deploy teachers in their schools taking interest as well as qualification into account. As it has been said before a teacher with a liking for mathematics will unconsciously convey this liking in his or her
teaching style and infect the children with a similar liking. After all, liking what one does in school greatly facilitates the learning process.

5.2.7 Implications of the Study

This research has revealed that, there is lack of adequate teaching materials ranging from textbooks to proper professional guidance from Teacher Advisory Centres. There is also the question of poor attitude of pupils as well as inadequate time allocated to the teaching of mathematics. Specialization has also been noted along with the poor command by pupils of the language of Instruction. In my view specialization could be based on the following clustering of subjects (a) Languages. (b) Mathematics, Science and Agriculture (c) Social Studies (d) Music, art, craft.

Improvement in the training programmes to ensure teachers attain appropriate teaching standards is essential. Teacher Advisory Centres should be equipped adequately to effectively improve the teacher quality. Greater liaison should be fostered between teacher training colleges and Teacher Advisory Centres as the two can benefit greatly from feedback provided by each institution.

Parents along with the Government as well as the NGOs should work together to ensure facilities are adequately provided for in the schools.
Headteachers should not only provide administrative leadership but equally important, professional leadership within their own schools.

5.2.8 Recommendations for Further Study

Research should be carried on to find out:

(1) The actual cause of the widespread poor attitude developed by pupils towards mathematics as a subject.

(2) The role the headteachers should actually play to improve the effective teaching of mathematics.

(3) Ways and means of improving the effectiveness of Teacher Advisory Centres.

(4) The implications of specialization in Teacher Training Colleges.

(5) Ways of ensuring that teachers upon graduation from colleges adopt newer techniques of teaching vis a vis the claim that teachers are taught by one method and expected to teach by another.


# RESEARCH TIME-TABLE

## September:
- **(a)** Preparation and submission of research proposal in consultation with supervisor.
- **(b)** Sending out letters to D.E.O., T.A.C., H/Teachers in Voi-Division of Taita-Taveta District.

## October

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st - 2nd week</td>
<td>Administering the questionnaires to teachers and headteachers in the various schools.</td>
</tr>
</tbody>
</table>
| 3rd - 4th Week    | **(a)** Collecting questionnaires and visits to TAC Centres and analysing data.  
                  | **(b)** Tabulation of data.                                             |

## November:

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Week</td>
<td><strong>(a)</strong> Organization and presentation of data.</td>
</tr>
</tbody>
</table>
| 2nd week          | **(b)** Discussion of data and checking by supervisor and re-writing.    
                  | **(c)** Correction by supervisor and re-writing.                          |
| 3rd Week          | **(a)** Typing                                                            
                  | **(b)** Proof reading                                                     
                  | **(c)** Photocopying and binding                                          
                  | **(d)** Signing by supervisor.                                            |
| 4th Week to 2nd Week of December: | Submission of the bound research project for examination. |
### APPENDIX 2

#### THE BUDGET

This questionnaire is divided into two parts: Part A and Part B. Answer the questions as honestly as you can. The information provided is for statistical purposes.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Travelling</td>
<td>KSHS. 3,000 CT 00</td>
</tr>
<tr>
<td>(b) Stationery, photocopying</td>
<td>KSHS. 3,500 CT 00</td>
</tr>
<tr>
<td>(c) Typing &amp; binding.</td>
<td>KSHS. 2,500 CT 00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>KSHS. 9,000 CT 00</strong></td>
</tr>
</tbody>
</table>

**PART A**

1. School: ____________________________ Class: ____________________________
2. Sex: ____________________________
   Male: ____________________________
   Female: ____________________________
3. Highest educational qualification:
   Std. 1: ____________________________
   Form 2: ____________________________
   Form 4: ____________________________
   Form 6: ____________________________
4. Indicate whether you are trained:
   Untrained: ____________________________
   Trained: ____________________________
5. Highest professional qualification:
   A.T.C: ____________________________
   P1: ____________________________
   P2: ____________________________
APPENDIX 3

QUESTIONNAIRE FOR TEACHERS

Instructions:

(i) This questionnaire is divided into two parts: Part A and Part B.

(ii) Answer all the questions as honestly as you possibly can tick where brackets are provided.

(iii) All the responses will be treated with utmost confidentiality.

PART A

1. School: ---------------- Class: -------------

2. Sex: ----------------

   Male: ( )
   Female: ( )

3. Highest educational qualification:
   Std. 7 ( )
   Form 2 ( )
   Form 4 ( )
   Form 6 ( )

4. Indicate whether you are trained:
   Untrained ( )
   Trained ( )

5. Highest professional qualification:
   A.T.S. ( )
   S1 ( )
   P1 ( )
   P2 ( )
P3

P4

Other (specify): ----------------------

6. Teaching experience:

Less than 1 year
1 - 5 years
5 - 10 years
Over 10 years

7. Teaching load per week.

Less than 30 periods
31-40 periods
41-50 periods

8. Do you consider the number of periods allocated to mathematics adequate to cover the syllabus?

Yes
No

9. What number of periods per week would you suggest?

10. What would you say about the teaching load in mathematics:

Very overloaded
Overloaded
Just enough
Light timetables

11. Is the mathematics syllabus appropriate?

Yes
No
12. Has your school got sufficient textbooks?
   Yes ( )
   No ( )

13. List down the textbooks (title and author) you use in order of frequency of use.
   (a) ________________________________
   (b) ________________________________
   (c) ________________________________
   (d) ________________________________
   (e) ________________________________

14. Are the classes overcrowded?
   Yes
   No ( )

15. How many students do you have? ____

16. List down the teaching methods you use in order of frequency of use.

17. What in general is the attitude of the students toward mathematics as a subject?
   Very interested ( )
   Interested ( )
   Not interested ( )

18. What do you think influences this attitude most?
19 How often do you use teaching aids in your lesson?

Regularly

Very useful ( )

Rarely

Not useful ( )

Not at all

20 List the aids you regularly use

21 When testing your pupils do you emphasise processes involved or the results obtained?

Process

Yes ( )

No ( )

Result

Yes ( )

No ( )

22 How would you say K.C.P.E. has influenced the teaching of mathematics in general.

Positively

( )

Negatively

( )

Has had no effect
23 What is the cause of this influence?

24 (a) Do you ever receive the K.C.P.E. Newsletter?

(b) Do you find comments in the K.N.E.C., K.C.P.E. Newsletters useful for instructional purposes?

25 How effective do you think primary teacher training colleges prepare teachers to teach mathematics?

26 Should all teacher trainees in the primary T.T.C.'s be required to learn and teach mathematics?

27 Should teacher-trainees specialise in the subjects of their choice?

28 What three subjects would you be teaching if you had a choice to make in order of preference
29 Were you initially interested in becoming a teacher?

Yes ( )
No ( )

30 Do you think the inability to speak, understand and write English is a handicap to pupils in the learning of mathematics?

Yes ( )
No ( )

31 Do you find Teacher Advisory Centres useful?

Yes ( )
No ( )

32 What would you expect from TAC?

Very useful ( )
Useful ( )
Not useful ( )

33 Have you ever been inspected?

Yes ( )
No ( )
34 Have you been inspected in the last three years?

Yes ( )
No ( )

35 Do you find the 'advice' given by the inspectors professionally useful?

Yes ( )
No ( )

36 Have you attended any in-service courses since the introduction of the 8-4-4 system?

Yes Regularly ( )
No Rarely ( )

37 Have you attended any seminar or workshop since the introduction of the 8-4-4 system?

Yes Very useful ( )
No Useful ( )

38 From the workshops and seminars attended, were your experiences useful professionally?

Very useful ( )
Useful ( )
Not useful ( )

39 How often does the headteacher check on:

(a) Schemes of work
Regularity ( )
Rarely ( )
Not at all ( )

(b) Lesson plans.
40 Are the comments made by headteachers professionally helpful in?
   (a) Schemes of work       Yes ( ) No ( )
   (b) Lesson plans          Yes ( ) No ( )

41 Does the headteacher take a keen interest in the teaching and learning of mathematics.
   Yes ( )
   No ( )

42 How often do you discuss with the headteacher the teaching and evaluation in mathematics?
   Regularly ( )
   Rarely ( )
   Not at all ( )

43 Is the headteacher supportive in your endeavour to improve the teaching of mathematics.
   Yes ( )
   No ( )

44 How often do you as mathematics teachers meet to review teaching and performance in your subject?
   Regularly ( )
   Rarely ( )
   Not at all ( )
45 Briefly list in order of seriousness, the five major problems in the teaching of mathematics:

(a) 

Instructions:

1. This questionnaire is in two parts. Part A and Part B.
2. Answer all the questions accurately as you possibly can, tick where boxes have been provided.
3. All responses will be treated with the utmost confidentiality.

1. Name of School: 

46 Briefly write down the recommendations you would give to improve the teaching and learning of mathematics.
APPENDIX 4

HEADTEACHERS' QUESTIONNAIRE

Instructions:

(i) This questionnaire is in two parts. Part A and Part B.

(ii) Answer all the questions as honestly as you possibly can, tick where brackets are provided.

(iii) All responses will be treated with the utmost confidentiality.

1. Name of School: -----------

2. Sex:
   Male: ( )
   Female: ( )

3. Professional qualifications:
   A.T.S. ( )
   S1 ( )
   P1 ( )
   P2 ( )
   P3 ( )
   P4 ( )
   Others (specify) ------------------

4. Academic qualifications:
   Form 6 ( )
   Form 4 ( )
   Form 2 ( )
5. Experience as headteacher:
   - Less than 1 year
   - 1 - 5 years
   - 5 - 10 years
   - Over 10 years

6. Experience as headteacher in your present school:
   - Less than 1 year
   - 1 - 5 years
   - 5 - 10 years
   - Over 10 years

PART B
7. Do you teach mathematics in your school?
   - Yes
   - No

8. Do you consider the number of periods allocated to mathematics in upper primary adequate to cover the syllabus?
   - Yes
   - No

9. If you were to recommend, how many periods would you allocate to mathematics teaching per week per class.
   __________

10. Is the mathematics syllabus appropriate?
    - Yes
    - No
11 Do you consider the teachers of mathematics to be committed?

Very committed ( )
Committed ( )
Not committed. ( )

12 What is the general attitude of teachers towards mathematics as a subject.

Very interested ( )
Interested ( )
Not interested ( )

13 What is the general attitude of pupils toward mathematics?

Very interested ( )
Interested ( )
Not interested ( )

14 Has your school got sufficient textbooks for mathematics?

Yes ( )
No ( )

15 Are the available textbooks appropriate for teaching and learning mathematics?

Yes ( )
No ( )

16 List down the teaching methods that are used by your teachers, in order of frequency of use.
17 How would you say K.C.P.E. has influenced the teaching of mathematics?

Positively (  )
Negatively (  )
No influence (  )

18 How would you rate the inability to speak write and understand English as a handicap in learning mathematics?

Very serious (  )
Serious (  )
Not serious (  )

18 What would you say about the teaching load of mathematics teachers in your school?

Very overloaded (  )
Overloaded (  )
Just enough load (  )
Light timetables (  )

19 How often are the teachers visited by inspectors?

Regularly (  )
Periodically (  )
Not visited (  )

20 Since the introduction of 8-4-4 how many times have they been inspected.

21 Do you find the comments of inspectors useful?

Yes (  )
No (  )
22 How often are you involved in reviewing the teaching and performance of mathematics with your teachers?

- Very often
- Rarely
- Not at all

23 Do you find Teacher Advisory Centres useful to your teachers?

- Very useful
- Useful
- Not useful

24 How often are your teachers inserviced?

- Regularly
- Rarely
- Not at all

25 How often do you check on schemes, lesson plans and incorporation of teaching aids in mathematics teaching?

- Regularly
- Rarely
- Not at all

26 Do you think teachers should only be trained in the subjects of their choice in colleges?

- Yes
- No
27 Do you think poor evaluation techniques by subject teachers influence learning in mathematics?

Yes (    )
No (    )

28 Briefly list five problems in order of seriousness that affect the teaching of mathematics in your school.

29 Briefly outline the solutions you think are necessary to overcome the problems of teaching mathematics.
INTERVIEW SCHEDULE WITH T.A.C. TUTORS

This will be an informal interview. The leading questions planned for are:

1. How often do teachers of mathematics visit the Teachers Advisory Centres?

2. Do you obtain feedback to determine the effective implementation of advice given?

3. What problems do you experience as TAC tutors?

4. How can teachers benefit effectively from Teacher Advisory Centres.

Thanking you in advance,

Yours faithfully,

[Signature]
INTRODUCTORY NOTE FOR THE RESEARCH PROJECT.

M.ED. (PTE) II COURSE - 1992

STUDENT'S NAME: DRABIAH M. MAGANGA
REG. NO: E55/820790

The above named is our post-graduate student undertaking a Master's programme at this university. In the final year of the programme, it is the practice of this University for Masters Students to produce a piece of research project work as a partial fulfilment of the degree.

It is in this regard that I request you to assist and encourage this student in carrying out project work of the title:

A STUDY OF THE HEADTEACHERS' AND PRIMARY MATHEMATICS TEACHERS' PERCEPTIONS OF THE PROBLEMS OF TEACHING MATHEMATICS IN YOI DIVISION, TAITA-TAVETA DISTRICT.

Thanking you in advance,

Yours faithfully,

Dr. Twoli N.W.
COURSE CO-ORDINATOR, DEPARTMENT OF EDUCATIONAL COMMUNICATION & TECHNOLOGY.

TNW/enk.
DISTRICT EDUCATION OFFICE
TAITA/TAVETA
P.O. BOX 1004
MUNDANYI

Ref: C. 4/Vol. III/144

6th October, 1992

To Whom It May Concern:

AUTHORITY TO CONDUCT FIELD RESEARCH:

MR. MAGANGA KHADIAN MWANYUMBA-STUD. REG. NO. 655/
8207/90

The above named is a post-graduate student at Arystate
University, Nairobi, and is currently undertaking a research
on "Problems of Teaching Mathematics in Primary Schools in
Voi Division".

Having been positively identified, this office has granted
the said Mr. Mwanyumba full authority to visit Voi Division
schools for the sake of accomplishing the aforementioned
task.

Please accord him all the necessary assistance in that
regard.

Thank you.

[Signature]

Waithaka Kebuga
For: DISTRICT EDUCATION OFFICE
TAITA/TAVETA

UK/ckm
I must report to the District Commissioner of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.

2. Government Officers will not be interviewed without prior appointment.

3. No questionnaire will be used unless it has been approved.

4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.

5. You are required to submit at least four (4) bound copies of your final report.

6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.

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**CONDITIONS**

1. You must report to the District Commissioner of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
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6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.

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**REPUBLIC OF KENYA**

**RESEARCH CLEARANCE PERMIT**

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**CONDITONS—see back page**