A STUDY OF THE PROBLEMS FACED BY PRIMARY SCHOOL TEACHERS IN TEACHING MATHEMATICS IN UPPER PRIMARY CLASSES IN NDIA DIVISION OF KIRINYAGA DISTRICT

BY

PETER MUNENE MAGOCI

A RESEARCH PROJECT SUBMITTED TO THE FACULTY OF EDUCATION IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF EDUCATION OF KENYATTA UNIVERSITY
DECLARATION

THIS RESEARCH PROJECT IS MY ORIGINAL WORK
AND HAS NOT BEEN PRESENTED FOR A DEGREE IN
ANY OTHER UNIVERSITY.

PETER MUNENE MAGOCI

THIS RESEARCH PROJECT HAS BEEN SUBMITTED
FOR EXAMINATION WITH MY APPROVAL AS UNIVERSITY SUPERVISOR.

DR. PETER K. MUTUNGA
SENIOR LECTURER
KENYATTA UNIVERSITY
DEDICATION

This work is dedicated to my wife Rachel Muthoni and to our daughter Eunice Nyakio who tirelessly gave me encouragement and bore the pain and suffering of separation during the entire period of study. They showed love, patience and understanding at times when all seemed impossible.
ACKNOWLEDGEMENTS

I wish to express my appreciation of the good work of my supervisor, Dr. P.K. Mutunga. His scholarly guidance contributed immensely to the success of this project.

To my loving and enduring wife Rachel Muthoni Munene, who throughout the M.Ed. course gave me support and encouragement by accepting the "temporary separation" and taking care of our daughter. To her I am specially indebted.

Special regards go to my sister-in-law, Martha Mugo, who took care of our daughter when my wife went for further studies at the crucial time of concluding this study.

I cannot forget to give many thanks to my parents Phinehas Magoci and Eunice Magoci for the invaluable support and sacrifice they made to enable me succeed in Education. Without them, this work would not have been possible.

Finally, I am deeply indebted to the D.E.O. Kirinyaga, Headteachers and teachers of the schools I studied for their cooperation.
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
<td>(i)</td>
</tr>
<tr>
<td>Declaration</td>
<td>(ii)</td>
</tr>
<tr>
<td>Dedication</td>
<td>(iii)</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>(iv)</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>(v)</td>
</tr>
<tr>
<td>List of Tables</td>
<td>(ix)</td>
</tr>
<tr>
<td>Abstract</td>
<td>(xi)</td>
</tr>
</tbody>
</table>

**CHAPTER ONE**

1.0 INTRODUCTION ................................................................. 1
1.1 Background to the Problem .............................................. 1
1.2 Statement of the Problem ................................................ 7
1.3 Research Hypotheses ..................................................... 9
1.4 Purpose of the Study ..................................................... 10
1.5 Significance of the Study ............................................... 11
1.6 Scope of the Study ........................................................ 12
1.7 Organisation of the Study ............................................... 13
1.8 Definition of Terms ...................................................... 14

**CHAPTER TWO**

2.0 REVIEW OF RELATED LITERATURE ............................................. 17
2.1 Introduction........................................................................... 17
2.2 Teachers' Attitude Towards Mathematics ................................ 17
2.3 Teachers' Academic and Professional Qualifications .................. 21
    2.3.1 Inservice Training .................................................. 23
2.4 Teachers' Experience ....................... 26
2.5 Textbooks, Reference Books, and Other Teaching Resources ....................... 27
2.5.1 Textbooks ....................................... 27
2.5.2 Teaching Aids ............................... 28
2.6 Transfer of Teachers ......................... 29
2.7 Pupils-Teacher Ratio ......................... 31
2.8 Teachers' Teaching Load ..................... 33
2.9 Language used in Mathematics Instruction........................................... 34

CHAPTER THREE
3.0 DESIGN AND METHODOLOGY OF THE STUDY ........................................ 37
3.1 Introduction ................................. 37
3.2 Research Sample and It's Selection .... 38
3.3 Research Instruments ....................... 40
3.4 Procedure for Data Collection .......... 41
3.4.1 Pretesting of the Instruments .......... 41
3.4.2 Test Administration ....................... 42
3.5 Scoring ........................................... 42

CHAPTER FOUR
4.0 DATA ANALYSIS AND INTERPRETATION ........ 45
4.1 Introduction .................................... 45
4.2 Analysis of Data from Section I of the Teachers' Questionnaire .................. 45
4.2.1 Gender of Mathematics Teachers ........ 45
4.2.2 Age of Teachers of Mathematics ........ 46
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4 Teachers' Experience</td>
<td>26</td>
</tr>
<tr>
<td>2.5 Textbooks, Reference Books, and Other Teaching Resources</td>
<td>27</td>
</tr>
<tr>
<td>2.5.1 Textbooks</td>
<td>27</td>
</tr>
<tr>
<td>2.5.2 Teaching Aids</td>
<td>28</td>
</tr>
<tr>
<td>2.6 Transfer of Teachers</td>
<td>29</td>
</tr>
<tr>
<td>2.7 Pupils-Teacher Ratio</td>
<td>31</td>
</tr>
<tr>
<td>2.8 Teachers' Teaching Load</td>
<td>33</td>
</tr>
<tr>
<td>2.9 Language used in Mathematics Instruction</td>
<td>34</td>
</tr>
<tr>
<td><strong>CHAPTER THREE</strong></td>
<td></td>
</tr>
<tr>
<td>3.0 DESIGN AND METHODOLOGY OF THE STUDY</td>
<td>37</td>
</tr>
<tr>
<td>3.1 Introduction</td>
<td>37</td>
</tr>
<tr>
<td>3.2 Research Sample and It's Selection</td>
<td>38</td>
</tr>
<tr>
<td>3.3 Research Instruments</td>
<td>40</td>
</tr>
<tr>
<td>3.4 Procedure for Data Collection</td>
<td>41</td>
</tr>
<tr>
<td>3.4.1 Pretesting of the Instruments</td>
<td>41</td>
</tr>
<tr>
<td>3.4.2 Test Administration</td>
<td>42</td>
</tr>
<tr>
<td>3.5 Scoring</td>
<td>42</td>
</tr>
<tr>
<td><strong>CHAPTER FOUR</strong></td>
<td></td>
</tr>
<tr>
<td>4.0 DATA ANALYSIS AND INTERPRETATION</td>
<td>45</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>45</td>
</tr>
<tr>
<td>4.2 Analysis of Data from Section I of the Teachers' Questionnaire</td>
<td>45</td>
</tr>
<tr>
<td>4.2.1 Gender of Mathematics Teachers</td>
<td>45</td>
</tr>
<tr>
<td>4.2.2 Age of Teachers of Mathematics</td>
<td>46</td>
</tr>
</tbody>
</table>
4.2.3 Academic Qualification .................. 47
4.2.4 Grades Attained in Mathematics ........... 48
4.2.5 Professional Qualifications ............... 49
4.2.6 Attendance of Inservice Training in Mathematics .............. 50
4.2.8 Teachers' Teaching Load Per Week ...........
4.2.9 Number of Periods Taught in Mathematics Alone Per Week .......... 54
4.2.10 Adequacy of Time to Plan Lessons and Mark Pupils Work ........... 55
4.2.11 Teaching Experience ..................... 56
4.2.12 Rate of Transfer of Teachers ............... 57
4.2.13 Class Size .............................. 58
4.2.14 Ability to Assist Each Pupil During Mathematics Lessons ............. 60
4.2.15 Reference Books and Textbooks used by Teachers .................... 61
4.2.16 Provision of Reference and Textbooks ... 62
4.2.17 Sharing of Textbooks Among Pupils ...... 62
4.2.18 Provision, Availability, Quality and Use of Teaching Aids ............. 63
4.2.19 Situations in which Problems are Encountered when using English as a Medium of Instruction .................. 66
4.2.20 Problems which Affect the Performance of the Mathematics Teacher ............. 67
4.3 Analysis of Data from Section II of the Teachers' Questionnaire ............. 68
4.3.1 Number of Respondents in Each Statement Response Choice ............. 68
4.3.2 Favourable and Unfavourable Responses .... 70
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3.3 Summary of Scores from the Attitude Survey</td>
<td>72</td>
</tr>
<tr>
<td>4.4 Analysis of Data from the Checklist of Resources</td>
<td>73</td>
</tr>
<tr>
<td>4.4.1 Availability and Adequacy of Learning Resource Materials</td>
<td>73</td>
</tr>
<tr>
<td>4.5 Conclusion from the Teachers' Questionnaires and Checklist of Resources</td>
<td>75</td>
</tr>
<tr>
<td>4.5.1 Academic and Professional Qualifications</td>
<td>75</td>
</tr>
<tr>
<td>4.5.2 Teaching Experience, Rate of Transfer and Teaching Load</td>
<td>77</td>
</tr>
<tr>
<td>4.5.3 Availability of Mathematics Textbooks and Other Teaching Resources</td>
<td>78</td>
</tr>
<tr>
<td>4.5.4 Attitude Towards Mathematics</td>
<td>79</td>
</tr>
<tr>
<td>4.5.5 English as a Medium of Instruction</td>
<td>80</td>
</tr>
</tbody>
</table>

**CHAPTER FIVE**

5.0 SUMMARY, IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH          | 81   |
5.1 Introduction                                                        | 81   |
5.2 Summary of Findings                                                 | 81   |
5.3 Implications of the Study                                           | 83   |
5.4 Suggestions for Further Research                                    | 84   |

BIBLIOGRAPHY                                                            | 86   |

**APPENDICES**

Appendix A: Teachers' Questionnaire                                    | 92   |
Appendix B: Checklist of Mathematics Instructional Resources           | 105  |
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Number of Teachers Per Age Range</td>
<td>46</td>
</tr>
<tr>
<td>Table 2</td>
<td>Academic Qualifications</td>
<td>47</td>
</tr>
<tr>
<td>Table 3</td>
<td>Grades Attained in Mathematics</td>
<td>48</td>
</tr>
<tr>
<td>Table 4</td>
<td>Teachers' Professional Qualifications</td>
<td>49</td>
</tr>
<tr>
<td>Table 5</td>
<td>Frequency of Attendance of Inservice Courses</td>
<td>50</td>
</tr>
<tr>
<td>Table 6</td>
<td>Reasons for not Attending Inservice Courses</td>
<td>51</td>
</tr>
<tr>
<td>Table 7</td>
<td>Frequency of Assistance received from APSI/TAC Tutors</td>
<td>52</td>
</tr>
<tr>
<td>Table 8</td>
<td>Teachers' Teaching Load Per Week</td>
<td>53</td>
</tr>
<tr>
<td>Table 9</td>
<td>Number of Periods Taught in Mathematics Per Week</td>
<td>54</td>
</tr>
<tr>
<td>Table 10</td>
<td>Adequacy of Time to Plan Lessons and Mark Pupils' Work</td>
<td>55</td>
</tr>
<tr>
<td>Table 11</td>
<td>Teachers' Experience</td>
<td>56</td>
</tr>
<tr>
<td>Table 12</td>
<td>Rate of Transfer of Teachers Since January 1990</td>
<td>57</td>
</tr>
<tr>
<td>Table 13</td>
<td>Number of Years Teachers have Stayed in their Present Schools</td>
<td>58</td>
</tr>
<tr>
<td>Table 14</td>
<td>Average Number of Pupils in a Class</td>
<td>59</td>
</tr>
<tr>
<td>Table 15</td>
<td>Ability to Assist each Pupil During Mathematics Lessons</td>
<td>60</td>
</tr>
<tr>
<td>Table 16</td>
<td>Reference Books and Textbooks</td>
<td>61</td>
</tr>
<tr>
<td>Table 17</td>
<td>Sharing of Textbooks Among Pupils</td>
<td>63</td>
</tr>
<tr>
<td>Table 18A</td>
<td>Availability and Use of Teaching Aids</td>
<td>64</td>
</tr>
<tr>
<td>Table 18B</td>
<td>Provision of Teaching Aids</td>
<td>65</td>
</tr>
<tr>
<td>Table 18C</td>
<td>Quality of Teaching Aids</td>
<td>65</td>
</tr>
<tr>
<td>Table 19</td>
<td>Situations in which Language Problems are Encountered</td>
<td>66</td>
</tr>
</tbody>
</table>
Table 20: Summary of the Problems that Affect Performance of Mathematics Teachers .. 67

Table 21: Number of Respondents in Each Statement Response Choice .............. 69

Table 22: Number of Respondents who Scored Favourably or Unfavourably in each Statement ......................... 71

Table 23: Summary of Scores from the Attitude Survey ......................... 72

Table 24: Number of Items Available in Various Schools ......................... 74
ABSTRACT

The main purpose of this study was to find out the problems faced by upper primary mathematics teachers. To get this information, the researcher used two types of instruments; a teachers' questionnaire and a checklist of resources.

The teachers' questionnaire was divided into two sections. Section I was about general information about the teacher and Section II was an attitude survey. The checklist of resources contained some items commonly found in a mathematics department.

The research Sample comprised a senior teacher and mathematics teachers of standard four, five, six, seven and eight of fourteen randomly selected primary schools of Ndia Division. Out of the expected 84 teachers only 80 teachers responded to the questionnaire and checklist.

After the data was collected, it was tabulated and analysed using simple descriptive statistics like comparative percentages and means.

The study found that:

(1) Although inservice courses are organised regularly, not all teachers attend them.

(2) The majority of the teachers were not satisfied
with the professional assistance they received from the TAC tutors and APSIs.

(3) Most teachers were overloaded since they taught between 30 and 40 periods per week. Thus the teachers felt that they had inadequate time to plan lessons and mark pupils' assignments.

(4) The number of pupils per class was quite high. In most classes there were over forty-five (45) pupils per class. This affected the seating arrangements since pupils had to share the few desks which were available.

(5) All the schools in the study had an acute shortage of textbooks.

(6) Most teachers did not use any other reference books apart from the class textbook.

(7) There were insufficient teaching aids such as chalkboard instruments, dusters, coloured chalk, and mathematical sets, among others.

The researcher gave some suggestions about ways in which some of the above problems could be alleviated.

These suggestions were:
(1) Every teacher should be given an opportunity to attend an inservice course at least once per year. This will help the teacher to keep abreast with new teaching techniques, new knowledge and be well informed about any changes in the curriculum.

(2) TAC tutors in the four zones of Mutira, Inoi, Kiine, and Mwerua should give more regular professional advice to mathematics teachers; especially in the field of making and using teaching aids from the local environment.

(3) The teaching load of mathematics teachers should be reduced so as to allow them extra time to plan their lessons, mark pupils' work and assist individual pupils. The teachers should also be allowed to specialise in mathematics instead of being given several subjects to teach.

(4) The number of pupils per class should be reduced to a reasonable level, preferably less than forty pupils per class. This can be done by building more classrooms and equipping them with enough desks so as to avoid a situation where a desk is shared among four or more pupils.

(5) Teachers, parents and the community at large should work together to make sure that schools have enough textbooks and reference books. Books can be
bought through organised "Harambees" instead of the present system where every parent buys books for his/her child.

(6) Teachers should strive to acquire more teaching aids by improvishing what is found in their local environments.
CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND TO THE PROBLEM

There is no doubt that mathematics is regarded by the society to be a very important subject. Cockcraft (1982, p. 1) notes that:

"There can be no doubt that there is a general agreement that every child should study mathematics at school, indeed the study of mathematics --- is regarded by most people as being essential."

According to Kiragu (1986), Mathematics is a strategic subject in the development of science and technology and therefore, a thorough grounding in the subject is required if adequate levels of science and technology are to be achieved. Thus the importance of mathematics and its usefulness in other fields cannot be overemphasized.

Due to its overall importance in the various aspects of life, mathematics is a basic requirement for the study of several subjects at secondary school, courses at the Universities, teachers training colleges and other training institutions. This has necessiated mathematics to be made compulsory in both primary and secondary schools.
However, in spite of its importance in the various aspects of development, performance in mathematics in national as well as local examinations has been poor both at K.C.P.E. and K.C.S.E. levels.

At K.C.P.E. level, the performance of mathematics in 1990 was slightly better than the three previous years. However it was still poorly done. This has far reaching implications in the development of mathematics in the later years of school.

Table 1 below shows the performance in mathematics in 1990 K.C.P.E. 1987, 1988 and 1989 performances are given for comparison.

Table 1

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>National Raw Mean</td>
<td>20.32</td>
<td>22.15</td>
<td>19.17</td>
<td>22.75</td>
</tr>
<tr>
<td>Modal Mark</td>
<td>13</td>
<td>16</td>
<td>14</td>
<td>17</td>
</tr>
</tbody>
</table>


Table 1 above shows that the national raw mean mark for K.C.P.E. (1990) was 22.75. This might indicate among other things that the pupils might not have been properly prepared in mathematics by their
teachers. This leads to some basic questions; "could the teachers be experiencing problems teaching mathematics?" "Are the teachers competent enough to teach mathematics in our primary schools?"

The researcher intended to find out the problems that mathematics teachers face while teaching upper primary classes in Ndia Division of Kirinyaga District.

Although Kirinyaga District has been consistently doing well in K.C.P.E. (It has been ranked two, three or four nationally for the last four years), the performance in mathematics has been poor compared with the other subjects.
Table II below shows the breakdown of C.A.T.s results of Ndia Division, done by standard eight pupils during the first term of 1992.

Table II

<table>
<thead>
<tr>
<th>ZONE</th>
<th>ENG.</th>
<th>SWA.</th>
<th>MATHS</th>
<th>SC. &amp; AGR.</th>
<th>G.H.C.R.</th>
<th>A.C.M.</th>
<th>HSC./BED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inoi</td>
<td>57.53</td>
<td>56.47</td>
<td>52.22</td>
<td>62.64</td>
<td>50.82</td>
<td>57.04</td>
<td>53.45</td>
</tr>
<tr>
<td>Mutira</td>
<td>56.03</td>
<td>54.64</td>
<td>46.97</td>
<td>59.94</td>
<td>49.94</td>
<td>56.44</td>
<td>53.36</td>
</tr>
<tr>
<td>Mwerua</td>
<td>55.34</td>
<td>55.26</td>
<td>47.57</td>
<td>62.30</td>
<td>48.17</td>
<td>54.89</td>
<td>53.43</td>
</tr>
<tr>
<td>Kiine</td>
<td>49.42</td>
<td>51.58</td>
<td>42.30</td>
<td>58.67</td>
<td>46.18</td>
<td>52.35</td>
<td>47.72</td>
</tr>
<tr>
<td>Mean for Ndia Division</td>
<td>54.58</td>
<td>54.49</td>
<td>47.27</td>
<td>60.89</td>
<td>48.78</td>
<td>55.18</td>
<td>51.99</td>
</tr>
</tbody>
</table>

Table II above shows that the mean mark for mathematics was 47.27% which was the lowest compared with the other six (6) subjects.

Source: Divisional Education Office: Ndia Division.
Irumbi (1990), in his study of teachers' and pupils' characteristics that affect the performance of standard eight (8) pupils in mathematics, in Githunguri Educational Zone, found that:

1) Performance in mathematics ... was significantly affected by teachers' academic and professional qualifications.

2) Majority of teachers considered the availability of mathematics textbooks and other teaching resources as having an effect on the pupils performance in mathematics.

The National Development Plan for the period 1989 to 1993 has underlined the fact that, the parents and the beneficiaries of education and training will meet the cost relating to the provision of educational facilities and equipment. Indeed, it seems that the government's role in primary schools has been limited to the provision of teachers. The rest has been left to the parents; through school committees. This will worsen an already bad situation since researches done by Eshiwani (1983), Munguti (1984), and Muhandik (1984), indicates that the supply and availability of textbooks is highly inadequate in Kenyan primary schools. The researcher intended to find out whether the
resources needed in teaching of mathematics are available in primary schools to date.

According to Eshiwani (1983, p. 40), there are many primary school teachers who teach mathematics but who had failed or got a very poor grade in mathematics at K.C.E. (Now K.C.S.E.) level;

"The implication of this is that there is a large number of pupils being taught by teachers who are not qualified to teach mathematics and who may have no interest in the subject. As a consequence of the poor teaching, large numbers of pupils fail their examinations in mathematics."

In this regard, Eshiwani seems to support Sidhu (1982, p. 156) who states that;

"Teachers without proper (academic) qualification and proper (professional) training fail to do justice to the subject. An adequate high qualification of the teacher develops self-confidence in the teacher and serves as a sources of inspiration to his/her pupils."

The researcher, therefore, intended to find out the academic and professional qualifications of primary mathematics teachers and also the rate of turn-over of such teachers.
Munguti (1984) in his study found out that teachers' attitudes will either enhance or hinder the learning of mathematics and hence affect pupils' performance.

Indeed this agrees with later findings by Mwangi (1986) who found that teachers' negative attitude was being reflected in the students' poor performance in mathematics.

The researcher, therefore, intended to find out the attitude of mathematics teachers towards mathematics.

1.2 STATEMENT OF THE PROBLEM

According to the syllabus for Kenya Primary schools (1986, p. 207);

"The general aim of teaching mathematics is to produce an individual who will be able to use a mathematical way of thinking in the solution of everyday problems both familiar and unfamiliar. Thus the ultimate aim of mathematics is the application of mathematical knowledge in problem-solving situations rather than the acquisition of mathematical knowledge for its own sake."

There are many factors which can hinder the successful accomplishment of this aim. The researcher
confined himself to some of the problems that face the upper classes primary mathematics teachers while trying to meet this aim. The following factors were considered.

1) Teachers' attitude towards mathematics.
2) Teachers' academic and professional qualifications.
3) Teachers' experience.
4) Availability of text and reference books and other transfer of teachers.
5) Rate of transfer of teachers.
6) Class-size (pupils-teacher ratio)
7) Teachers' teaching load.
8) Language used in instruction.

The researcher felt strongly that the above factors might influence the performance of the mathematics teacher.

The title for this study is;

"A study of the problems faced by primary school teachers in teaching mathematics in upper primary classes in Ndia Division of Kirinyaga District".
1.3 RESEARCH HYPOTHESES

This researcher strived to collect data which enabled him to either reject or accept the following hypotheses:

Ho₁: Academic and professional qualifications have no significant contribution to the problems faced by upper primary mathematics teacher.

Ho₂: Teaching experience, rate of transfer and teaching load have no significant contribution to the problems faced by the upper primary mathematic teacher.

Ho₃: Availability of mathematics textbooks and other teaching resources have no significant contribution to the problems faced by the upper primary mathematics teacher.

Ho₄: Attitude of mathematics teachers towards mathematics has no significant contribution to the problems faced by the upper primary mathematics teachers.

Ho₅: English, as a medium of instruction, has no contribution to the problem faced by the upper primary mathematics teachers.
1.4 PURPOSE OF THE STUDY

In this study the researcher was guided by the following objectives:

1. To determine;
   a) the academic qualifications of the teacher as indicated by his/her certificate awarded by KNEC or other examination bodies at the end of primary or secondary education.
   b) the professional qualification as indicated by the certificate awarded by an examination body after undergoing professional training.

2) To find out;
   a) the teacher's experience as measured by the number of years he/she has taught before and after professional training.
   b) How many times a teacher has been transfered since January 1990 to date.
   c) How long a teacher has taught in his/her present school.
   d) the teacher's teaching load as measured by the number of lessons he/
she teaches in a week.

e) whether the teacher has attended any in-service courses in mathematics.

f) the pupils-teacher ratio as measured by the number of pupils in the mathematics class.

3) To investigate;

a) the number and type of mathematics textbooks and reference books used in the upper classes.

b) The number and type of mathematics teaching aids available for use in upper primary classes.

4) To find out the attitude of mathematics teachers towards mathematics as measured by the five-point Likert scale in an attitude survey.

5) To find out whether teachers experience problems while using English as a medium of instruction to teach some mathematics concepts.

1.5 SIGNIFICANCE OF THE STUDY

The study came up with findings which will be of help to the following
a) The primary mathematics teacher:
Once the teacher understands the problems which might hinder him/her from achieving the aim of teaching mathematics, the teacher can adjust and become a better teacher.

b) The K.I.E. personnel who are involved with the development of primary mathematics curriculum.

c) The TAC tutors and the Inspectorate (APSI):
Once they understand the problems faced by the mathematics teachers, they will be in a better position to give appropriate advice on how to overcome them.

d) Expansion of existing knowledge:
This study came up with new knowledge and facts which can be of importance to the society.

1.6 SCOPE OF THE STUDY

Limits

1) This study was confined to the factors mentioned in section 1.2 above.
2. Ndia Division has seventy two (72) primary schools. Out of these schools, only fourteen (14) schools were selected at random. Five mathematics teachers of upper classes from every selected school participated in this study. However three teachers did not submit their questionnaires and one senior teacher did not submit his checklist of resources. (see chapter 3 on research sample).

Thus the researcher used Eighty (80) teachers as the sample of the study.

This sample was such that it could not be used to generalise the results to the whole country.

Delimitation

Time: The time allowed to write the proposal, collect data and hand in the project was too short to allow for a bigger sample.

Finance: The money available for use in the project was too little. This limited the size of the sample.

1.7 ORGANISATION OF THE STUDY

Chapter One deals with the background and rationale of the problem. It also has the hypotheses of the
study, significance of the study, scope of the study, and definition of terms.

Chapter Two deals with review of related literature on Teachers' attitude, Teachers academic and professional qualifications, teachers' experience, availability of text and reference books, rate of transfer of teachers, class-size, teachers' teaching load, and language used in instruction.

Chapter Three deals with the research sample and its selection. It also describes the research instruments and how they were administered and scored.

Chapter Four deals with data analysis and its interpretation.

Chapter Five deals with summary, implication of the study, and recommendations for further research.

1.8 DEFINITION OF TERMS

Upper Primary

This includes standard four, five, six, seven and eight.
This is the examination given at the end of the primary circle.

This is an examination given at the end of four (4) years of secondary education.

K.N.E.C.: Kenya National Examination Council:
This is the body which sets and evaluate National examinations.

K.I.E. Kenya Institute of Education
This is the body which develops most of the curricula used in schools and colleges; excluding those used by the National Universities.

U.T. Untrained Teacher
This is a teacher who has not undergone any professional training.

T.T.C. Teachers' Training College
This is where primary school teachers are trained.
T.A.C.: Teachers' Advisory Centre

This is a centre which should give teachers professional advice on all area of education. They are manned by T.A.C. tutors.

A.P.S.I: Assistant Primary School Inspector.

Teaching Resource:

Anything that would help the teacher in teaching. This includes people, realia, textbooks, charts and models.

Textbooks

These are the books recommended by K.I.E. for use by teachers and pupils in the classroom.

Mock Examinations

These are examinations given prior to pupils seating for the actual K.C.P.E. examinations. They should reflect the qualities of the real examinations.
CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This chapter reviews literature related to the following:

1) Teachers' attitude towards mathematics
2) Teachers' academic and professional qualifications.
3) Teachers experience
4) Textbooks, reference books, and other teaching resources.
5) Transfer of teachers.
6) Pupils-teacher ratio
7) Teachers' teaching load.
8) Language used in maths instruction.

2.2 TEACHERS' ATTITUDE TOWARDS MATHEMATICS

Many educators agree that attitudes play an important role in the teaching and learning process. In relation to teaching, Munguti (1984. p. 40) in his study on "factors affecting teaching and learning of mathematics" has this to say:

"Teacher attitude towards mathematics is a factor that may affect the teaching and learning of mathematics... If the teachers' attitude are negative towards, mathematics, this in turn will affect his teaching of the subject and is reflected in pupils' performance."
Strollerg (1974) in his research has shown that teachers with neutral or negative attitudes can either avoid the teaching of mathematics or pass the negative attitude along to the young pupil. He further concludes that unless a teacher is attracted to mathematics, all the content and teaching methods can be of no use.

Phillips (1973) also notes that teachers who dislike mathematics teach the subject as a routine and sometimes leads to total neglect of the teaching of the subject.

Cornelius (1982) has noted that the teachers' attitude towards a pupils' mathematics performance may have more influence on his future development and emotional reaction to the subject than the special characteristics of the subject itself.

According to Johnson and Raising (1972, p. 264), the teachers' appreciation of mathematics as an important, dynamic subject must be real and deep. His attitude to students must be sympathetic and understanding; his interest in learning must be great. If
the teacher's attitude or interest are less favourable or the same as those of the student, no transmission of enthusiasm can take place. The teacher should always make his students feel that his attitude will be friendly regardless of success or failure of the student. The student with proper attitude will derive pleasure from his contact with mathematics.

Many studies indicates some relevance to the assumption that teachers' attitudes influence the pupils' attitude towards mathematics. Phillips (1973) showed in his study that the teachers' attitude towards mathematics is significantly related to pupils' attitude and achievement. Okech (1980) in his research in "attitude towards mathematics of standard six pupils and teachers in Kenya," came up with the same findings:

Cockcroft (1982, p. 188) notes that:

"There is no area of knowledge where a teacher has more influence over the attitudes as well as the understanding of his pupils, than he does in mathematics. During his professional life, a teacher of mathematics may influence for good or ill the attitudes towards mathematics of several thousand young people, and decisively affect their career choices."
This indicates that teachers' attitude towards mathematics has great impact on the subject.

Johnson and Raising (1972 p. 281) seem to take the same line when he states;

"It is the attitude that our students develop which are likely to stimulate or stop further study of the subject ... Often it is the attitude as a teacher you build that are the basis of your rank as a successful or unsuccessful teacher."

A recent study done by Tumbo (1991) on the attitudes of pre-service teachers towards mathematics found that:

1. About twenty five percent of pre-service teachers were afraid of mathematics because they were poor with figures and feared word problems.

2. Many of the pre-service teachers were not looking forward to teaching mathematics.

In this study, Tumbo recommended that further research be done as a follow up of teachers after qualifying from the colleges to see whether there is a change in their attitudes towards the subject after some experience in teaching.
The researcher, therefore, wanted to find out what attitudes teachers of Ndia Division have towards mathematics.

2.3 TEACHERS' ACADEMIC AND PROFESSIONAL QUALIFICATIONS

According to Eshiwani (1985, p. 5), qualification of a teacher is very important indicator of the quality of education provided. The training of primary school teachers in Kenya has not kept abreast to the pressing demands for them in recent years following the tremendous growth in primary school enrolment. Eshiwani (1985) noted that in 1980, seventy percent (70%) of the teachers in Kenya were trained while thirty percent (30%) were untrained. In 1981, the respective figures were sixty six percent (66%) and thirty four (34%) untrained. The status of the teaching profession today needs determination.

According to Karauri (1992), the government has stopped the employment of untrained teachers as at January 1991. Indeed the primary TTCs are admitting ninty percent (90%) of their students from U.T.s and only ten percent (10%) from arid areas as from 1992. It is hoped that this training will eventually remove all the U.T.s from the teaching profession.
Sidhu (1982, p. 156) says that:

"Teachers without proper (academic) qualifications and proper (professional) training, fail to do justice to the subject. An adequate high qualification of the teacher develops self-confidence in the teacher and serves as a source of inspiration to his/her pupils."

Irumbi (1990), in his study of teachers' and pupils' characteristics that affect the performance of pupils in mathematics, found that performance in mathematics was significantly affected by the teacher's academic and professional qualifications.

This finding seems to agree with that done earlier by Eshiwani (1984, p. 30) who found that there are many primary school teachers who teach mathematics but who had failed or got very poor grades in mathematics at K.C.E. (now K.C.S.E.) level.

"The implication of this is that there is a large number of pupils being taught by teachers who are not qualified to teach mathematics and who may have no interest in the subject. As a consequence of the poor teaching, large numbers of pupils fail their examinations in mathematics."

The National Committee on educational objectives and policies (NCEOP) of 1976 was concerned about the
large number of untrained primary school teachers. The NCEOP (1976, p. 106) observed that many of the U.Ts were found to be having very poor mastery of content. The commissioners therefore felt that the qualitative improvement of education can only occur if there is a major improvement of the quality of teachers and teacher training.

The researcher attempted to establish the professional and academic qualification of teachers of mathematics in Ndia Division.

2.3.1 INSERVICE TRAINING

The primary school mathematics curriculum has witnessed many changes for the last three decades. There was the traditional mathematics which was later replaced by the new mathematics programme in 1971. In 1981, appropriate mathematics programme was introduced. Later in 1985, 8:4:4 mathematics curriculum was implemented.

"In all countries throughout the world the system of education is going for a single course of teacher training however long it lasts and however excellent it may be, no longer suffices in view of radical changes which may intervene."
Muhandik (1984, p. 45) found that;

"Teachers who did not attend any refresher courses in mathematics still continued to teach mathematics as they used to teach the modern mathematics without knowing for certain what to omit, what to teach, and how to teach it."

Mbiru (1983) further found out that the poor performance in mathematics in schools was due to lack of regular inservice courses offered to teachers. According to Shuard (1980) majority of the teachers need fairly regular courses and inservice training while Greenland (1983) says that the purpose of inservice training is to help primary teachers become better teachers. Hence it is imperative that primary school mathematics teachers have to be offered opportunities to attend inservice courses as often as possible if they have to be effective in their classroom teaching.

A report by UNESCO (1970, p. 24) states that:

"In all countries throughout the world whatever the system of education in existence, teachers must be given continuing opportunities for learning. A single course of teacher training, however long it lasts and however excellent it may be, no longer suffices in view of radical changes which may intervene."
Reporting on inservice course he held in Mombasa, Eshiwani (1976, p. 3) had this to say:

"Most of our primary school teachers are not very strong in mathematics. For these teachers rapid innovations in mathematics can only succeed in undermining their confidence and arousing their hostility... it was wrong to introduce... changes without paying much attention to retraining of mathematics teachers."

According to Ayot (1980, p. 1), there is an urgent need for updating teachers to cope with the new development in methodology, content and the use of new teaching materials to be able to maintain effective classroom learning. If teachers are not given inservice training for any curriculum change, the whole innovation would be shortlived or never implemented.

It is due to the importance of inservice training that the researcher felt the necessity to investigate whether teachers of mathematics have been undergoing inservice training to cope with the needs and demands of the 8:4:4 primary mathematics curriculum.
2.4 TEACHERS' EXPERIENCE

According to Irumbi (1990, p. 39), teaching experience is frequently included as a variable in educational research, but no clear picture of its effects seems to emerge.

Barnes (1985) suggests that teacher effectiveness, while it may increase through the early years of the teaching career, probably does not continue to do so. He notes that increases in teaching experience, at least after the early years in the classroom, are associated with a tendency for teachers to reject innovations and alterations in education policy.

Sidhu (1982, p. 195) seems to contradict this point when he says:

"Successful teaching experience ... is also a valuable asset. It will enable the person to acquire certain commendable characteristics such as promptness, adaptability, efficiency, the knack of arousing and maintaining interest, adequate command of instructional materials and the ability to face the class with confidence."

The researcher strived to get the experience (in years of teaching) of the primary mathematics teachers.
2.5 TEXTBOOKS, REFERENCE BOOKS, AND OTHER TEACHING RESOURCES.

2.5.1 Textbooks

The textbook is an important medium of instruction in the teaching of mathematics. After determining the mathematics topics to be taught at a given level, the textbook may be helpful to the teacher in guiding him on how to approach the various topics. Johnson and Rising (1972, p. 370) has this to say:

"The mathematics textbook is a major factor in determining what mathematics topics are taught and how they are taught. A textbook often dictates the scope, the sequence, and even the pace of the mathematics program... its importance increase when instruction is inadequate."

Thus the mathematics textbook is very important especially where we have untrained teachers.

However despite the importance of textbooks, various studies by Eshiwani (1983), Munguti (1984) and Muhandik (1984), indicate that the supply and availability of textbooks is highly inadequate in Kenyan primary schools. The researcher intended to find out if mathematics textbooks were available in our primary schools to date.
2.5.2 TEACHING AIDS

Teaching aids in the school assist the teacher to transfer skills and concepts to the pupils in a relatively quicker way. Anyona (1988, p. 14) notes that;

"The creative teacher must motivate his pupils, he must communicate his knowledge to them, and he must, partly through the use of instructional aids, guide them to discover ideas. He needs to know what materials are available and where and how to use these materials to enrich the learning of mathematical ideas. An effective mathematics teacher uses models to help his pupils think."

Pupils are likely to participate fully in classroom learning if teachers use teaching aids. The non-availability of teaching aids may result in a teacher's failure to communicate accurately the intended mathematical concept. Nzoka (1987, p. 82) on a study on "factors that causes low performance in K.C.P.E." found that insufficient learning materials and facilities contribute greatly to the poor performance. Earlier Munguti (1984) in his study found that lack of teaching aids affect the teaching and learning of mathematics.

Although lack of funds is the major excuse for lack of teaching aids, some items can be made locally
by the teachers and pupils. According to Sidhu (1982), these items may not be very precise and accurate, but have the two notable advantages over those that are produced commercially. First, pupils always take pride in the equipment made by themselves with the result that their interests in using such equipment is increased. Secondary they are more likely to understand clearly the fundamental principles upon which mathematical instruments are based since in the process of making them, such principles are used.

According to Mukwa (1986, p. 1), commercially produced teaching aids are not used efficiently and accurately by the teachers.

"Because some of the aids, cannot match the teachers' local requirements .... and objectives." (Omwono 1990, p. 27).

As observed by Kalejaiye (1985, p. 26), resources for teaching mathematics are common in the schools' environment and can be collected by pupils and preserved.

2.6 TRANSFER OF TEACHERS

Teachers and parents have often expressed their dissatisfaction over the high rate of teachers' trans-
fers. Many teachers have had to go on transfer after teaching in one particular school for a period of less than one year. In this connection the N.C.O.P (1976:p. 109) observed that the stability of educational institutions could be improved by retaining teachers for reasonable periods of time.

Eshiwani (1983, p. 38), in a study done in western province, found that fifty percent (50%) of the schools lose one teacher every term through transfers, while twenty percent (20%) of the schools loose at least two teachers every term. In this study, it was found that the school that had maintained high records of academic achievement were those with less teacher transfers.

The researcher felt that the frequent transfer of teachers destabilise their teaching. This is because they have to get acquainted with their colleagues, look for housing, change their bank accounts and either bring their families along or be separated from them. Thus frequent transfer can be a major problem to the teacher. The researcher therefore tried to find out the rate of transfer of mathematics teachers in Ndia Division.
2.7 PUPILS – TEACHER RATIO

Eshiwani (1985, p. 2) notes that the ratio of pupils to teachers is often considered an important indicator of the quality of education. The basic assumption being that a low ratio means small classes, thus enabling teachers to pay more attention to individual pupils.

Sidhu (1982, p. 158) claims that large class-size is a problem. No individual attention can be paid to the pupils and it becomes difficult for the teacher to establish close contacts with the students.

Eshiwani (1983, p. 40) was of the opinion that teachers operating in a situation where the ratio of pupils to teachers is high would be expected to be overworked; so that this would adversely affect his performance in the classroom.

Irumbi (1990, p. 40) notes that the class size is a variable which at first seems likely to produce substantial differences in instructional outcome. Teachers in general have been pressing for smaller pupils-teacher ratio in order that each pupil might be given more of the teachers time. Individual differences among children is a factor which need to
be considered by teachers in their teaching of mathematics. In this respect, the researcher felt that this is only possible in smaller classes rather than bigger ones.

Husen (1967) as quoted by Kiragu (1986) found that in a majority of cases, size of class is not related to mathematics achievement. However in some cases he found significant differences in scores between students from larger and smaller classes depending on the educational system and level. In this case he seems to contradict later findings by Eshiwani (1985) mentioned earlier.

The researcher felt that, with the present dimensions of our primary classrooms, a high pupils-teacher ratio was likely to bring in congestion in the classroom thus hampering desk arrangement and free movements of pupils. This in turn would affect the choice of the teaching method to be adopted by the teacher.

According to Johnson and Rising (1972, p. 264) it is extremely important that the classroom atmosphere be friendly, accepting and supportive, even when it is demanding and challenging. A spirit of security, enjoyment, and loyalty should be the basic goal of
classroom organisation. However this is only possible with a small pupils-teacher ratio where a teacher can give each pupil his due attention. It is with this in mind that the researcher intended to find out the pupils-teacher ratio of mathematics classes in Ndia Division.

2.8 TEACHERS' TEACHING LOAD

If a teacher is over-loaded with so many lessons per week, then no matter what his good intentions are, he will be overworked and thus will likely not be able to prepare his lessons well. Sidhu (1982, p. 156) says that when a teacher is overburdened, he tends to follow the way of least resistance. He emphasises on rote learning; he cannot adopt, and prepare for, effective methods, as he has no spare time. He thus cannot cater for individual differences and neither can he make use of, leave alone improvise, teaching aids. In mathematics, where marking and correction of pupils' exercise books is required on almost daily basis, the overloaded teacher is likely to experience serious problems due to lack of time to do the correction.

The researcher felt that a heavy teaching load for the mathematics teachers can be a problem to him; and hence there was a need to find the distribution of lessons among the mathematics teachers of upper-classes in Ndia Division.
Obstacles can be placed in the path of children which have little to do with mathematical ideas but which are created because of problems of language. Orton (1987, p. 127) brings out this point very clearly when he notes:

"An unusual problem of language is one that we (teachers) create ourselves when we make a careful definition and then misuse the word. The most obvious example of this is when we describe axes on a cartesian graph as 'horizontal' and 'vertical'. It cannot help the many children who are still struggling to understand what we mean by 'vertical' and 'horizontal' when we carelessly refer to one of the horizontal lines on the graph paper on their desks as 'vertical'."

The Kenya Educational Journal (1965, p. 24) commented that the precision with which a concept is developed is a function of the precision of the language used to develop it. Thus, for pupils to understand mathematics well, it should be taught in a language that they are able to understand. Therefore the teacher should use the simplest terminologies available; by bringing himself to the same level as the pupil.
Sidhu (1982, p.158) says:

"The language used (by the teacher) should be simple and clear. Any abstractions and symbols should be explained using terms already known to the pupils. In addition the language should be interesting and thought provoking."

Eshiwani (1987, p. 5) agrees with Sidhu when he noted;

"Simple words and phrases should be used in the early stages of learning of new (mathematics) concepts until these concepts have been firmly established in the minds of the children. Only then should unfamiliar technical terms be introduced for them; and only then if they are essential for future work."

However it is not always possible to use simple words especially when using a second language (rather than the mother tongue) to teach mathematics. One of the major problems of using English as a medium of instruction in mathematics is the difficulty of making translation from mother-tongue to English. This is because there are no explicit vernacular words to express certain mathematical concepts. Eshiwani (1987, p. 1) illustrates this point with an example;

"... In many African languages the word 'round' is used to describe both the circle and the sphere. A maths teacher who is
not aware of this is likely to conclude that his pupils cannot make a conceptual distinction between two and three dimensions".

In a situation like the one described above, the teacher could communicate with his pupils better by use of words and models.

The researcher wanted to find out whether primary mathematics teachers of upper classes were encountering any problems when using English as a medium of instruction.

As mentioned earlier in section 1.5 of Chapter One, the researcher hoped to expand on the existing knowledge on the problems faced by the mathematics teacher while-teaching in primary schools. This study came up with findings which agree with others presented by Munguti (1984) Muhandik (1984), and Muriuki (1991), among others.
3.0 DESIGN AND METHODOLOGY OF THE STUDY

3.1 INTRODUCTION

This chapter provided the guidelines on the procedures which were followed in the implementation of the study.

The data required for this study was collected from primary schools in Ndia Division, Kirinyaga District. The respondents of the research were mathematics teachers of standard four (4), five (5), six (6), seven (7), eight (8) and senior teachers of these schools. As mentioned in section 1.2 of chapter one, the information which was required was on: teacher's attitude towards mathematics, teacher's academic and professional qualification, teacher's experience, availability of textbooks, reference books and other teaching resources, transfer of teachers, class-size, teacher's teaching load, and language used in mathematics instruction.

This chapter is divided into four sections. The first section describes the sample and how it was selected. The second section describes the instruments. The third section describes how the instruments were administered and the fourth section describes the scoring methods.
3.2 RESEARCH SAMPLE AND IT'S SELECTION

Although the total number of primary schools in Ndia Division is seventy two (72), the population of this study was sixty nine primary schools. This was because three schools were deliberately left out of the study due to their special qualities. These schools were:

(a) Kerugoya school for the deaf: This is a primary school which caters for deaf and dumb pupils. It has its own special qualities which cannot be generalised to other schools.

(b) Kerugoya Township Primary School: This is a boarding private primary school. It is a high cost school and quite well equipped. Therefore it would not have been a representative of the local primary schools.

(c) St. Agness Primary School was also left out due to the same reasons as 'b' above.

Out of these sixty nine schools, fourteen (14) schools were randomly selected using stratified random sampling. The stratas were based on the four
educational zones of INOI, MUTIRA, MWERUA and KIINE. The selection was based on the table of random numbers. Four schools were randomly selected from Inoi zone, three schools were selected from Mutira zone, three schools were selected from Mwerua zone, and four schools were selected from Kiine zone.

Harper (1989) notes that taking a random sample reduces the possibility of taking a sample with unsuspected bias. He observes that, in taking a random sample, there is a good chance of producing a sample that represents the population in every characteristic. Hence taking a random sample of fourteen schools was considered to be appropriate for this study.

From the fourteen (14) randomly selected primary schools, the teachers teaching mathematics in upper classes formed the sample of this study. The senior teacher of each of the fourteen schools was also included.

Therefore the researcher anticipated to have seventy (70) teachers and fourteen (14) senior teachers to have a total sample of eight-four (84) teachers. However three (3) teachers did not submit the questionnaires while one senior teacher did not return a check-
list of resources. Thus the study had a total of Eighty (80) respondents.

Where there were two or more streams and different teachers teaching mathematics in these streams, only one teacher was randomly selected. That is there was one teacher selected from standard four, five, six, seven and eight to make a total of five teachers per school plus the senior teacher. Where the senior teacher was absent in any school, then the Deputy Headteacher took his/her place. In a school where one teacher taught more than one upper class (that is the total number of upper class mathematics teachers of that school was less than five), then the researcher ignored such a school and randomly select another one which met the criterion.

3.3 RESEARCH INSTRUMENTS

The researcher used a teacher's questionnaire (Appendix A), and a checklist of resources (Appendix B). The teacher's questionnaire had two parts. Part I had the general information questions about the teacher. Part II was an attitude survey.

The researcher considered a questionnaire appropriate due to a number of reasons. Kerlinger
(1973) in Kiragu (1986) observes that a questionnaire is widely used in research because it is possible to give similar or standardized questions to the respondents. This makes it possible to compare responses from different respondents on the same questions. It is possible to research distant respondents by either posting the questionnaires or delivering them personally. By using a questionnaire, the researcher guaranteed anonymity to the respondents and hence encouraged them to give honest responses. This consequently increased the reliability, validity and usability of the instrument.

The checklist included the teaching and learning resources found in a mathematics department. This checklist was completed by the senior teacher or, in his/her absence, the deputy headteacher of the selected schools.

3.4 PROCEDURE FOR DATA COLLECTION

3.4.1 PRE-TESTING OF THE INSTRUMENTS

The teachers' questionnaire and checklist were pretested in two schools. These schools were selected at random from among the schools forming the population of this study. The pretest helped the researcher to modify some items in the questionnaire and checklist.
This modification helped to control problems of ambiguity and irrelevance and hence improved on the quality of the answers given by the respondents.

3.4.2 TEST ADMINISTRATION

The researcher administered the questionnaire and checklist personally to the selected teachers in their respective schools. He explained to the respondents the purpose of the study and the instructions that were to be followed when completing the questionnaire. The respondents were required to fill their questionnaires independently without consulting each other. The researcher hoped that this would ensure reliability and validity of the information given.

3.5 SCORING

The attitude survey consisted of twenty (20) items. Each item was scored according to the feelings that it portrayed. The items were a series of statements which the respondents were expected to respond to by making a choice from five possibilities which were provided. These possibilities were: strongly agree, agree, undecided, disagree and strongly disagree.

For statements portraying positive feelings towards mathematics, points were awarded as follows:
Strongly Agree - 5 points
Agree - 4 points
Undecided - 3 points
Disagree - 2 points
Strongly Agree - 1 point

For statements portraying negative feelings, the points were awarded such that "strongly Agree" had one point and "strongly disagree" five points.

Therefore, the maximum points that could have been scored was one hundred (100) and the minimum was twenty (20) points. A score of twenty points was to be interpreted to mean extreme or perfect negative feelings towards mathematics. A score of one hundred (100) points meant perfect positive feelings towards mathematics.

To determine whether the feelings of a respondent was negative or positive, the average score was found as follows:

\[
\text{Average Score} = \frac{\text{Maximum Score} + \text{Minimum Score}}{2}
\]

\[
= \frac{100 + 20}{2}
\]

\[
= 60 \text{ points}
\]
Therefore any respondent who scored sixty (60) points was said to be neutral; whereas if he/she scored above sixty points, it was interpreted as positive and below sixty as negative feelings.
4.0 DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

The main objective of this study was to investigate the problems faced by the mathematics teachers in upper primary classes in Ndia Division of Kirinyaga District.

To collect data on these problems the researcher used the following instruments:

(a) Teachers' questionnaire (Appendix A).

(b) Checklist of teaching resources (Appendix B).

This chapter therefore presents an analysis of the responses provided by teachers of mathematics and observations from the checklist. To present this data the researcher has used tables with frequency distributions and percentages of these responses wherever applicable. Data interpretation is followed by a discussion after each table.

4.2 ANALYSIS OF THE DATA FROM SECTION I OF THE TEACHERS' QUESTIONNAIRE

4.2.1 GENDER OF MATHEMATICS TEACHERS

Question item number one was intended to gather information about the ratio of male teachers to female
teachers. It was observed that 73.13% of the teachers in the study were male teachers while the rest were female teachers. This indicates that most teachers of mathematics in upper classes are male.

4.2.2 AGE OF TEACHERS OF MATHEMATICS

The intention of question item two from the teachers' questionnaire was to depict the age range of teachers of mathematics. Older teachers are expected to have been teaching for a longer time than the young ones; although as mentioned earlier in chapter two, they tend to be more resistant to changes in the curriculum. The results of the responses are indicated in the table I below.

Table I: Number of teachers per age range

<table>
<thead>
<tr>
<th>AGE RANGE (YEARS)</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 24</td>
<td>2</td>
<td>2.99</td>
</tr>
<tr>
<td>Between 25-30</td>
<td>20</td>
<td>29.85</td>
</tr>
<tr>
<td>Between 31-35</td>
<td>13</td>
<td>19.40</td>
</tr>
<tr>
<td>Between 36-40</td>
<td>15</td>
<td>22.39</td>
</tr>
<tr>
<td>Above 40</td>
<td>17</td>
<td>25.37</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table I above shows that 29.85% of the teachers were between 25 to 30 years of age. Seventeen of the
teachers (25.37%) were above 40 years of age.

4.2.3 ACADEMIC QUALIFICATION

Teachers academic qualification is an important factor in the teaching of any subject as it is generally believed that the higher the qualification the more knowledge of content the teacher has. Question item three attempted to solicit information about the academic qualification of mathematics teachers. Table 2 below indicates the findings.

Table 2: Academic qualifications

<table>
<thead>
<tr>
<th>ACADEMIC QUALIFICATION</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAPE/KPE/CPE</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>KJSE</td>
<td>4</td>
<td>5.97</td>
</tr>
<tr>
<td>EACE/KCE/KCSE</td>
<td>48</td>
<td>71.64</td>
</tr>
<tr>
<td>EAACE/KACE</td>
<td>14</td>
<td>20.90</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 above indicates that 71.64% of the teachers have completed four years of secondary education while 20.90% have gone up to A-levels. The results shows that most teachers in Ndia division are capable of teaching mathematics.
4.2.4 GRADES ATTAINED IN MATHEMATICS

The question item number four attempted to find out the grades obtained in mathematics by upper classes teachers of Ndia division. Table 3 below indicates the results.

Table 3: Grades attained in mathematics

<table>
<thead>
<tr>
<th>EXAMINATION</th>
<th>GRADE ATTAINED IN MATHEMATICS</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAPE/KPE/CPE</td>
<td>Pass</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td></td>
<td>Fail</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>KJSE</td>
<td>Pass</td>
<td>3</td>
<td>4.47</td>
</tr>
<tr>
<td></td>
<td>Fail</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>KACE/KCE/KCSE</td>
<td>Distinction (A)</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td></td>
<td>Credit (B-C)</td>
<td>34</td>
<td>50.74</td>
</tr>
<tr>
<td></td>
<td>Pass (D)</td>
<td>16</td>
<td>23.88</td>
</tr>
<tr>
<td></td>
<td>Fail (E)</td>
<td>10</td>
<td>14.95</td>
</tr>
<tr>
<td>EAACE/KACE</td>
<td>Subsidiary</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Principle</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Results from table 3 above indicates that 50.74% of the teachers had a credit in mathematics at O-level while 14.92% had failed. The implication is that 77.7% of the teachers have a strong mathematical background to enable them to teach mathematics in upper classes.
4.2.5 PROFESSIONAL QUALIFICATIONS

It is generally assumed that effectiveness in teaching largely depends on the professional qualification of the teachers. Item question number five attempted to solicit information about teachers' professional qualifications. The results are indicated below in table 4.

Table 4: Teachers' professional qualifications

<table>
<thead>
<tr>
<th>QUALIFICATION</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT</td>
<td>2</td>
<td>2.99</td>
</tr>
<tr>
<td>P3</td>
<td>2</td>
<td>2.99</td>
</tr>
<tr>
<td>P2</td>
<td>10</td>
<td>14.93</td>
</tr>
<tr>
<td>P1</td>
<td>52</td>
<td>77.60</td>
</tr>
<tr>
<td>S1</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4 above shows that 77.6% of the teachers are P1s, while 14.93% are P2s. The findings show that only 2.99% of the teachers had not received any form of training in teaching. From this it is clear that most teachers (97.01%) in the Division have the required professional qualification.
4.2.6. ATTENDANCE OF IN-SERVICE TRAINING IN MATHEMATICS

In-service training helps teachers in keeping abreast with new trends in curriculum development, methodology, resource use, evaluation, et cetera. The question items number six and seven were intended to reveal the number of times the teachers of mathematics had attended in-service courses. Item eight was intended to find out the reasons for not attending the courses. The results are indicated in table 5 and 6 below.

Table 5: Frequency of attendance of Inservice courses

<table>
<thead>
<tr>
<th>NUMBER OF TIMES</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>17</td>
<td>25.37</td>
</tr>
<tr>
<td>Once</td>
<td>6</td>
<td>8.96</td>
</tr>
<tr>
<td>Twice</td>
<td>3</td>
<td>4.48</td>
</tr>
<tr>
<td>Thrice</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>More than three</td>
<td>40</td>
<td>59.70</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5 above shows that 74.63% of the teachers attended inservice courses in mathematics whereas only 25.37% of the teachers had never attended any course. Indeed 59.70% of the teachers had attended four or more inservice courses. This indicates that most mathe-
matics teachers (74.63%) are well informed about new trends in mathematics.

For those teachers who had not attended any in-service courses, the reasons they gave are summarised in table 6.

Table 6: Reasons for not attending inservice courses

<table>
<thead>
<tr>
<th>REASONS</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not invited</td>
<td>15</td>
<td>88.24</td>
</tr>
<tr>
<td>Lack of time to attend</td>
<td>1</td>
<td>5.88</td>
</tr>
<tr>
<td>Attendance blocked</td>
<td>1</td>
<td>5.88</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>17</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 6 indicates that 88.24% of the teachers who had not attended any inservice courses in mathematics had not been invited. 11.76% of these teachers had been invited to attend inservice courses but for one reason or another, they were unable to attend. The implication is that these teachers will not be aware of any new developments in mathematics curriculum.
4.2.7 ASSISTANCE RECEIVED FROM APSI AND/OR TAC TUTORS

Question item nine was intended to find out if APSI and/or TAC tutors gave adequate assistance to the teachers of mathematics in Ndia Division. Table 7 below gives the summary of the responses.

Table 7: Frequency of assistance received from APSI/TAC tutors

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>10</td>
<td>14.93</td>
</tr>
<tr>
<td>Rarely</td>
<td>35</td>
<td>52.23</td>
</tr>
<tr>
<td>Regularly</td>
<td>22</td>
<td>32.84</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 7 above indicates that 67.16% of the teachers felt that the APSI/TAC personnel were not providing the assistance expected. From this it is quite clear that the TAC tutors in Ndia Division are not effectively playing their role as suppliers of resource materials and as general professional advisors.

4.2.8 TEACHERS' TEACHING LOAD PER WEEK

Question item number 11 was intended to show the average number of periods that each teacher in the study taught per week. This is important because the teaching load indicated whether the teacher had enough time for planning his lessons and marking pupils' work.
Table 8 below gives the results.

Table 8: Teachers' teaching load per week

<table>
<thead>
<tr>
<th>PERIODS PER WEEK</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>Between 20 and 30</td>
<td>7</td>
<td>10.45</td>
</tr>
<tr>
<td>Between 31 and 40</td>
<td>47</td>
<td>70.15</td>
</tr>
<tr>
<td>Over 40</td>
<td>12</td>
<td>17.91</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 8 above indicates that 70.15% of the teachers taught between 31 and 40 periods per week. Indeed 17.91% of the teachers taught more than 40 periods per week. The small number of teachers who taught less than 30 periods per week happen to be teachers who are heavily loaded with other responsibilities like general administration duties. Although there is no clear guideline about the maximum number of periods a teacher can effectively handle, most teachers who taught over 30 periods per week considered themselves as being overloaded (see 4.2.20). If teachers are expected to teach effectively then their teaching load should be made lighter.
4.2.9 NUMBER OF PERIODS TAUGHT IN MATHEMATICS ALONE PER WEEK

Question items 10 and 12 were intended to find out whether mathematics teachers taught other subjects and the number of periods dedicated to mathematics teaching. All the teachers in the study indicated that they taught other subjects apart from mathematics. The number of periods taught in mathematics alone per week is indicated in Table 9 below.

Table 9: Number of periods taught in mathematics per week.

<table>
<thead>
<tr>
<th>NUMBER OF PERIODS</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 to 11</td>
<td>50</td>
<td>74.63</td>
</tr>
<tr>
<td>12 to 17</td>
<td>11</td>
<td>16.42</td>
</tr>
<tr>
<td>18 to 23</td>
<td>5</td>
<td>7.46</td>
</tr>
<tr>
<td>Over 23</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 9 above shows that 74.63% of the teachers taught between 6 to 11 periods of mathematics per week. The implication is that only a small number of teachers are allowed to concentrate in teaching mathematics. The researcher feels that more teachers should be allowed to teach mathematics alone so that they may have confidence in the subject.
4.2.10 ADEQUACY OF TIMES TO PLAN LESSONS AND MARK PUPILS' WORK

Question item 13, 14 and 15 were intended to find out if teachers had adequate time to plan their lessons and mark pupils work. Planning lessons in advance is a mark of efficiency, and successful teaching and learning. Table 10 below shows the findings.

Table 10: Adequacy of time to plan lessons and mark pupils' work

<table>
<thead>
<tr>
<th>RESPONSES</th>
<th>ADEQUATE TIME TO PLAN</th>
<th>ADEQUATE TIME TO MARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Teachers</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>44</td>
</tr>
<tr>
<td>Percentage</td>
<td>34.33</td>
<td>65.67</td>
</tr>
</tbody>
</table>

From the table above, 65.67% of the teachers claimed that they did not have enough time to plan their lessons. 82.09% of the teachers said that they did not have enough time to mark the assignments they gave to the pupils. Most of the teachers indicated overloading as one of the problems which brought about this situation. The implication here is that most mathematics lessons are not well prepared and that pupils assignments are not corrected. In a situation like this, a teacher can neither evaluate himself nor his pupils.
4.2.11 TEACHING EXPERIENCE

Question item 16 was intended to find out the number of years the respondents had taught. It is generally assumed that positive experience enables a teacher to acquire certain commendable characteristics such as the best way to use instructional resources and the ability to face the class with confidence. Table 11 below gives the findings.

Table 11: Teachers' experience

<table>
<thead>
<tr>
<th>NUMBER OF YEARS OF TEACHING</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than one</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td>Between 1 and 4</td>
<td>9</td>
<td>13.43</td>
</tr>
<tr>
<td>Between 5 and 8</td>
<td>12</td>
<td>17.91</td>
</tr>
<tr>
<td>Between 9 and 12</td>
<td>14</td>
<td>20.90</td>
</tr>
<tr>
<td>13 and above</td>
<td>31</td>
<td>46.27</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 11 above indicates that 46.27% of the teachers had taught for 13 or more years. In fact 85.08% of the teachers had taught for five or more years. This implies that most of the teachers in the sample had taught for many years and therefore were expected to have gained adequate experience in teaching.
4.2.12 RATE OF TRANSFER OF TEACHERS SINCE JANUARY 1990

Question items 17 and 40 were intended to find out how often teachers have been transfered since January 1990. Frequent transfer of teachers destabilise their teaching. This is because they have to get acquainted with their colleagues and pupils, look for housing, change their bank accounts, and either bring their families along or be separated from them. Table 12 and 13 below gives the results.

Table 12: Rate of transfer of teachers since January 1990

<table>
<thead>
<tr>
<th>NUMBER OF TIMES TRANSFERED</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not transfered</td>
<td>48</td>
<td>71.64</td>
</tr>
<tr>
<td>Once</td>
<td>13</td>
<td>19.40</td>
</tr>
<tr>
<td>Twice</td>
<td>4</td>
<td>5.97</td>
</tr>
<tr>
<td>Three or more</td>
<td>2</td>
<td>2.99</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 12 above indicates that 71.64% of the teachers in the study had not been transfered since January 1990. Only 28.36% of the teachers had been transfered once or more times. The implication here is that the teachers are quite stable in their working
stations. Table 13 below indicates the number of years each teacher in the study had taught in his/her present school.

Table 13: Number of years teachers have stayed in their present schools

<table>
<thead>
<tr>
<th>NUMBER OF YEARS</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than one</td>
<td>15</td>
<td>22.39</td>
</tr>
<tr>
<td>Between 1 and 2</td>
<td>4</td>
<td>6.98</td>
</tr>
<tr>
<td>Between 3 and 4</td>
<td>19</td>
<td>28.35</td>
</tr>
<tr>
<td>5 or more</td>
<td>29</td>
<td>42.28</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 13 above shows that 42.28% of the teachers in the study had taught for five or more years in their present schools. This implies that they have become acquainted with their pupils and the problems facing their various schools.

4.2.13 CLASS SIZE

Item number 18 was intended to indicate the number of pupils per class that each teacher taught. This is important since there is a common belief that teachers teach more effectively when they handle smaller classes. This is because small classes are
more manageable and they allow easy detection of individual differences. According to primary school inspectorate circular (Form A), any class with an enrolment of 55 or more pupils must be split into two. Thus the Ministry of Education consider a class of 55 pupils to be impossible to teach. Table 14 below indicates the findings.

Table 14: Average number of pupils in a class

<table>
<thead>
<tr>
<th>CLASS SIZE</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 40</td>
<td>43</td>
<td>64.18</td>
</tr>
<tr>
<td>Between 30 and 40</td>
<td>24</td>
<td>35.82</td>
</tr>
<tr>
<td>Less than 30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 14 above shows that 64.18% of the teachers taught classes that had more than 40 pupils. Indeed some teachers indicated that they had classes which had enrolment of over 60 pupils despite the aforementioned circular on enrolment. The implication of this is that the teacher can find it very difficult to control the class and teach effectively at the same time.
4.2.14 ABILITY TO ASSIST EACH PUPIL DURING MATHEMATICS LESSONS

Question items 19 and 20 were intended to find out whether teachers were able to assist each pupil during mathematics lessons and the reasons for being unable to assist. Table 15 below indicates the findings.

Table 15: Ability to assist each pupil during mathematics lessons

<table>
<thead>
<tr>
<th>RESPONSES</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to assist</td>
<td>6</td>
<td>8.96</td>
</tr>
<tr>
<td>Unable to assist</td>
<td>61</td>
<td>91.04</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 15 above indicates that 91.04% of the teachers in the study were unable to assist individual pupils during the mathematics lessons. Most teachers sighted overloading and large classes as some of the factors that made them unable to assist individual pupils. This implies that pupils are not given individual attention for their various individual needs.
4.2.15 REFERENCE AND TEXTBOOKS USED BY TEACHERS

Item numbers 21 and 22 were intended to show mathematics reference and textbooks that are used by teachers and pupils respectively. This is essential since it reflects teachers' awareness of the type of books that they use and the content within. Table 16 below gives the results.

Table 16: Reference books and textbooks

<table>
<thead>
<tr>
<th>BOOKS</th>
<th>NO. OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Mathematics (K.I.E.)</td>
<td>67</td>
<td>100</td>
</tr>
<tr>
<td>Revision Mathematics (J. Oconner)</td>
<td>16</td>
<td>23.88</td>
</tr>
<tr>
<td>Preparatory Mathematics (Mehta &amp; Desai)</td>
<td>12</td>
<td>17.91</td>
</tr>
<tr>
<td>Upper Primary Mathematics (M. Singh)</td>
<td>4</td>
<td>5.97</td>
</tr>
<tr>
<td>Complete KCPE Mathematics (Kihara &amp; Ngunjiri)</td>
<td>4</td>
<td>5.97</td>
</tr>
<tr>
<td>Revision Mathematics (Patel)</td>
<td>2</td>
<td>2.99</td>
</tr>
</tbody>
</table>

Table 16 above indicates that the most popular book is Primary Mathematics (K.I.E.) which is used by all teachers. Only 56.72% of the teachers in the study referred to other reference books apart from the class textbook. This implies that pupils are not exposed to solving problems from other books so as to get a variety.
4.2.16 PROVISION OF REFERENCE AND TEXTBOOKS

Item number 23 was intended to find out who provides mathematics reference and textbooks used by both teachers and pupils in upper primary classes. 100% of the teachers reported that it is the responsibility of the parents to purchase the required textbooks and exercise books for their children. This implies that in schools where parents are poor, the pupils and teachers will have to do with inadequate supplies of both textbooks and reference books thus affecting negatively teaching and learning of mathematics.

4.2.17 SHARING OF TEXTBOOKS AMONG PUPILS

Item numbers 24 and 25 were intended to find out the degree of availability of textbooks among pupils. The respondents were supposed to indicate whether there were enough books to go round the pupils or whether there was some sharing of any copies available. Table 17 below gives the findings.
Table 17: Sharing of textbooks among pupils

<table>
<thead>
<tr>
<th>NUMBER OF PUPILS SHARING</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>No sharing</td>
<td>1</td>
<td>1.51</td>
</tr>
<tr>
<td>Two Pupils per Book</td>
<td>23</td>
<td>34.32</td>
</tr>
<tr>
<td>Three Pupils per Book</td>
<td>26</td>
<td>38.80</td>
</tr>
<tr>
<td>More than 3 Pupils per Book</td>
<td>17</td>
<td>25.37</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 17 above shows that 98.49% of the teachers indicated that there was sharing of textbooks. Indeed 64.17% of the teachers indicated that the sharing was among 3 or more pupils. The researcher observed that the sharing of one textbook among 4 or more pupils would mean rearrangement of desks. The implication of this is that a lot of time would be wasted while rearranging desks and also the movement of the teacher around the classroom would be affected.

4.2.18 PROVISION, AVAILABILITY, QUALITY AND USE OF TEACHING AIDS

Teaching aids play a very important role in teaching and learning of mathematics. They help pupils to translate abstract concepts into reality. Lack of teaching aids can therefore have negative effect on
the teaching/learning of mathematics. Item numbers 26, 27, 28, 29, 31 and 32, were intended to solicit information about teaching aids, whether they are available in schools, whether they are actually used in classroom teaching, how good the teaching aids are, and lastly who provides them. The following tables gives the results.

Table 18A: Availability and use of teaching-aids

<table>
<thead>
<tr>
<th>RESPONSES</th>
<th>USE OF TEACHING AIDS</th>
<th>ADEQUACY OF TEACHING AIDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Number of Teachers</td>
<td>56</td>
<td>11</td>
</tr>
<tr>
<td>Percentage</td>
<td>83.58</td>
<td>16.42</td>
</tr>
</tbody>
</table>

Table 18A above shows that 83.58% of the teachers indicated that they use teaching aids. However 89.55% of the teachers also indicated that they considered the teaching aids not adequate. This implies that there could be quite a big number of topics where teaching aids are not used.
Table 18B: Provision of Teaching Aids

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Education</td>
<td>4</td>
<td>5.97</td>
</tr>
<tr>
<td>School Committee/PTA</td>
<td>5</td>
<td>7.46</td>
</tr>
<tr>
<td>Teachers and/or Pupils</td>
<td>58</td>
<td>86.57</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 18B above shows that 86.57% of the teachers indicated that they make their own teaching aids. The implication of this is that since the same teachers had indicated that they were overloaded, they might not have time to make the required teaching aids.

Table 18C: Quality of Teaching Aids

<table>
<thead>
<tr>
<th>RESPONSES</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Quality</td>
<td>4</td>
<td>5.97</td>
</tr>
<tr>
<td>Average Quality</td>
<td>21</td>
<td>31.35</td>
</tr>
<tr>
<td>Poor Quality</td>
<td>42</td>
<td>62.68</td>
</tr>
<tr>
<td>TOTAL</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 18C shows that 62.68% of the teachers indicated that they found the teaching aids available for their use to be of poor quality. Indeed 79% of the teachers said that their teaching was adversely
affected due to the poor quality of the teaching aids. This implies that there might be less learning due to the poor translation from abstract concepts to real-life situations.

4.2.19 SITUATIONS IN WHICH PROBLEMS ARE ENCOUNTERED WHEN USING ENGLISH AS A MEDIUM OF INSTRUCTION

Item number 38 was intended to find out whether teachers experience any problems when using English as a medium of instruction. 83.58% of the teachers indicated that they encountered problems. Item number 39 was intended to find out under what situations these problems are encountered. Table 19 below gives the findings.

Table 19: Situations in which language problems are encountered

<table>
<thead>
<tr>
<th>SITUATIONS</th>
<th>NO. OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introducing a new Topic</td>
<td>34</td>
<td>50.70</td>
</tr>
<tr>
<td>Pupils asking Questions</td>
<td>28</td>
<td>41.79</td>
</tr>
<tr>
<td>Pupils Explaining their Answers</td>
<td>43</td>
<td>64.17</td>
</tr>
<tr>
<td>When Pupils are using Textbooks</td>
<td>20</td>
<td>29.85</td>
</tr>
</tbody>
</table>

Table 19 above shows that 64.17% of the teachers encountered language problems when they ask the pupils
to explain their answers. This implies that English as a medium of instruction is a big obstacle to the teaching/learning of mathematics due to the low ability of the pupils in understanding and communicating in the language.

4.2.20 PROBLEMS WHICH AFFECT THE PERFORMANCE OF THE MATHEMATICS TEACHERS

Item number 41 asked the teachers to give four problems which they thought affected their performance while teaching mathematics. The table below gives the summary of the problems.

Table 20: Summary of the problems that affect performance of mathematics teachers

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>NUMBER OF TEACHERS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor background of Pupils in Maths</td>
<td>30</td>
<td>44.77</td>
</tr>
<tr>
<td>Large Classes</td>
<td>16</td>
<td>23.88</td>
</tr>
<tr>
<td>Over-load of Teacher</td>
<td>33</td>
<td>49.25</td>
</tr>
<tr>
<td>Language Difficulties</td>
<td>33</td>
<td>49.25</td>
</tr>
<tr>
<td>Lack of Resources</td>
<td>58</td>
<td>86.57</td>
</tr>
<tr>
<td>Large Syllabus to cover</td>
<td>21</td>
<td>31.34</td>
</tr>
<tr>
<td>Poor Teaching/Learning Environment</td>
<td>8</td>
<td>11.94</td>
</tr>
</tbody>
</table>

Table 20 above indicates that the most common problem is lack of resources which was indicated by
86.57% of the teachers. 49.25% of the teachers indicated that both over-load of the teacher and language difficulties were major problems to the teacher. 44.77% of the teachers indicated that poor background of the pupils was a problem to the teaching of mathematics. These problems were common to most teachers irrespective of their academic and professional qualifications.

4.3 ANALYSIS OF DATA FROM SECTION II OF THE TEACHERS' QUESTIONNAIRE

In the analysis of Section II of the Teachers' questionnaire, reference will be made to Appendix A. The teachers were provided with twenty (20) multiple choice test items. The researcher used these test items to find out the feelings of the teachers about mathematics. The number and percentages of the respondents in each test item response choice for these twenty test items is summarised in the tables given below.

4.3.1 NUMBER OF RESPONDENTS IN EACH STATEMENTS RESPONSE CHOICE

Here, the researcher wanted to find out the number of respondents who agreed or disagreed with each statement item. The respondents who chose "Strongly Agree" and "Agree" were grouped together under "Agree". Those who chose "Strongly Disagree" and "Disagree" were
grouped together as "Disagree". The table below provides the results.

Table 21: Number of respondents in each Statement response choice

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>TYPE</th>
<th>STATEMENT</th>
<th>AGREE</th>
<th>%</th>
<th>UNDECIDED</th>
<th>%</th>
<th>DISAGREE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P</td>
<td>P</td>
<td>67</td>
<td>100</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2</td>
<td>N</td>
<td>N</td>
<td>14</td>
<td>20.9</td>
<td>2</td>
<td>3.3</td>
<td>51</td>
<td>76.1</td>
</tr>
<tr>
<td>3</td>
<td>N</td>
<td>I</td>
<td>7</td>
<td>10.4</td>
<td>4</td>
<td>6.6</td>
<td>56</td>
<td>83.6</td>
</tr>
<tr>
<td>4</td>
<td>P</td>
<td>P</td>
<td>65</td>
<td>97.0</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>5</td>
<td>N</td>
<td>I</td>
<td>14</td>
<td>20.9</td>
<td>11</td>
<td>16.4</td>
<td>42</td>
<td>62.7</td>
</tr>
<tr>
<td>6</td>
<td>P</td>
<td>P</td>
<td>24</td>
<td>35.8</td>
<td>3</td>
<td>4.5</td>
<td>40</td>
<td>59.7</td>
</tr>
<tr>
<td>7</td>
<td>N</td>
<td>N</td>
<td>3</td>
<td>4.5</td>
<td>2</td>
<td>3.0</td>
<td>62</td>
<td>92.5</td>
</tr>
<tr>
<td>8</td>
<td>P</td>
<td>P</td>
<td>58</td>
<td>86.6</td>
<td>3</td>
<td>4.4</td>
<td>6</td>
<td>9.0</td>
</tr>
<tr>
<td>9</td>
<td>N</td>
<td>N</td>
<td>31</td>
<td>46.2</td>
<td>5</td>
<td>7.6</td>
<td>31</td>
<td>46.2</td>
</tr>
<tr>
<td>10</td>
<td>P</td>
<td>P</td>
<td>64</td>
<td>95.5</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>11</td>
<td>N</td>
<td>N</td>
<td>9</td>
<td>13.5</td>
<td>1</td>
<td>1.5</td>
<td>57</td>
<td>85.0</td>
</tr>
<tr>
<td>12</td>
<td>N</td>
<td>N</td>
<td>8</td>
<td>11.9</td>
<td>10</td>
<td>15.0</td>
<td>49</td>
<td>73.1</td>
</tr>
<tr>
<td>13</td>
<td>P</td>
<td>P</td>
<td>64</td>
<td>95.5</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>14</td>
<td>N</td>
<td>I</td>
<td>11</td>
<td>16.4</td>
<td>2</td>
<td>3.0</td>
<td>54</td>
<td>80.6</td>
</tr>
<tr>
<td>15</td>
<td>P</td>
<td>P</td>
<td>54</td>
<td>80.6</td>
<td>1</td>
<td>1.5</td>
<td>12</td>
<td>17.9</td>
</tr>
<tr>
<td>16</td>
<td>P</td>
<td>N</td>
<td>38</td>
<td>56.7</td>
<td>4</td>
<td>6.2</td>
<td>25</td>
<td>37.1</td>
</tr>
<tr>
<td>17</td>
<td>N</td>
<td>N</td>
<td>2</td>
<td>3.0</td>
<td>2</td>
<td>3.0</td>
<td>63</td>
<td>94.0</td>
</tr>
<tr>
<td>18</td>
<td>P</td>
<td>P</td>
<td>65</td>
<td>97.0</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>19</td>
<td>N</td>
<td>N</td>
<td>2</td>
<td>3.0</td>
<td>1</td>
<td>1.5</td>
<td>64</td>
<td>95.5</td>
</tr>
<tr>
<td>20</td>
<td>P</td>
<td>P</td>
<td>57</td>
<td>85.0</td>
<td>0</td>
<td>0.0</td>
<td>10</td>
<td>15.0</td>
</tr>
<tr>
<td>Average</td>
<td>P</td>
<td>P</td>
<td>56</td>
<td>83.6</td>
<td>1</td>
<td>1.5</td>
<td>10</td>
<td>14.9</td>
</tr>
<tr>
<td>Average</td>
<td>N</td>
<td>N</td>
<td>10</td>
<td>14.9</td>
<td>4</td>
<td>6.0</td>
<td>53</td>
<td>79.9</td>
</tr>
</tbody>
</table>

Where P = Positive Statement  
N = Negative Statement
The above table shows that an average of 83.6% of the respondents agreed with the positive statements and 79.1% disagreed with the negative statements. Only 6.5% of the respondents were undecided.

4.3.2 FAVOURABLE AND UNFAVOURABLE RESPONSES

In the table below, the respondents who agreed with a positive statement and those who disagreed with a negative statement were grouped together under the heading "Favourable". Those who disagreed with a positive statement and those who agreed with a negative statement were grouped together under the heading "Unfavourable". The table below gives the findings.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Favourable</th>
<th>Unfavourable</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 22: Number of respondents who scored favourably or unfavourably in each statement

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>FAVOURABLE</th>
<th>UNDECIDED</th>
<th>UNFAVOURABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM</td>
<td>TYPE</td>
<td>NUMBER</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>P</td>
<td>67</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>N</td>
<td>51</td>
<td>76.1</td>
</tr>
<tr>
<td>3</td>
<td>N</td>
<td>56</td>
<td>83.6</td>
</tr>
<tr>
<td>4</td>
<td>P</td>
<td>65</td>
<td>97.0</td>
</tr>
<tr>
<td>5</td>
<td>N</td>
<td>42</td>
<td>62.7</td>
</tr>
<tr>
<td>6</td>
<td>P</td>
<td>24</td>
<td>35.8</td>
</tr>
<tr>
<td>7</td>
<td>N</td>
<td>62</td>
<td>92.5</td>
</tr>
<tr>
<td>8</td>
<td>P</td>
<td>58</td>
<td>86.5</td>
</tr>
<tr>
<td>9</td>
<td>N</td>
<td>31</td>
<td>46.2</td>
</tr>
<tr>
<td>10</td>
<td>P</td>
<td>64</td>
<td>95.5</td>
</tr>
<tr>
<td>11</td>
<td>N</td>
<td>57</td>
<td>85.0</td>
</tr>
<tr>
<td>12</td>
<td>N</td>
<td>49</td>
<td>73.1</td>
</tr>
<tr>
<td>13</td>
<td>P</td>
<td>64</td>
<td>95.5</td>
</tr>
<tr>
<td>14</td>
<td>N</td>
<td>54</td>
<td>80.6</td>
</tr>
<tr>
<td>15</td>
<td>P</td>
<td>54</td>
<td>80.6</td>
</tr>
<tr>
<td>16</td>
<td>P</td>
<td>38</td>
<td>56.7</td>
</tr>
<tr>
<td>17</td>
<td>N</td>
<td>63</td>
<td>94.0</td>
</tr>
<tr>
<td>18</td>
<td>P</td>
<td>65</td>
<td>97.0</td>
</tr>
<tr>
<td>19</td>
<td>N</td>
<td>64</td>
<td>95.5</td>
</tr>
<tr>
<td>20</td>
<td>P</td>
<td>57</td>
<td>85.0</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>54</td>
<td>80.6</td>
</tr>
</tbody>
</table>

Table 22 above indicates that an average of 80.6% of the teachers considered the statements favourably. Only statements 6 and 9 had 59.7% and 46.20% of the respondents respectively consider them unfavourably. An average of 4.5% of the teachers were undecided.
This implies the majority of the respondents understood and indeed made decisions on the statements.

4.3.3 SUMMARY OF SCORES FROM THE ATTITUDE SURVEY

The table below gives a summary of the scores of the respondents from the attitude survey. All respondents who scored less than 60 were to be considered to have negative attitude and those who scored more than 60 were to be considered to have positive attitude (See chapter 3, section 3.5 on scoring).

**Table 23: Summary of scores from the attitude survey**

<table>
<thead>
<tr>
<th>RANGE OF SCORES</th>
<th>NUMBER OF RESPONDENTS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 - 69</td>
<td>3</td>
<td>4.48</td>
</tr>
<tr>
<td>70 - 74</td>
<td>7</td>
<td>10.45</td>
</tr>
<tr>
<td>75 - 79</td>
<td>20</td>
<td>29.85</td>
</tr>
<tr>
<td>80 - 84</td>
<td>20</td>
<td>29.85</td>
</tr>
<tr>
<td>85 - 89</td>
<td>13</td>
<td>19.40</td>
</tr>
<tr>
<td>90 - 94</td>
<td>3</td>
<td>4.48</td>
</tr>
<tr>
<td>95 - 99</td>
<td>1</td>
<td>1.49</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>67</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Average Attitude Score $= \frac{\sum X_i}{67} = 81$

Where $X_i = \text{Attitude score of each respondent}$
The table above shows that all the respondents had scored more than 60 points. Indeed the average attitude score was 81 points. This implies that 55.2% of the respondents had scores which were above the average score. Thus all the respondents in the study had positive attitude towards mathematics.

4.4 ANALYSIS OF DATA FROM THE CHECKLIST OF RESOURCES

4.4.1 AVAILABILITY AND ADEQUACY OF LEARNING RESOURCE MATERIALS

The study attempted to find out the availability and adequacy of some specific teaching aids and facilities in upper primary classes. Lack of some teaching aids might imply that some topics are not taught adequately and effectively. Likewise lack of adequate facilities like desks might affect learning due to discomfort of many pupils sharing a single desk. The table below indicates the results.
Table 24: Number of items available in various schools

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>% OF THE SCHOOLS WITH THE ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std.4 Textbooks</td>
<td>48</td>
<td>165</td>
<td>99</td>
<td>110</td>
<td>40</td>
<td>70</td>
<td>18</td>
<td>70</td>
<td>20</td>
<td>42</td>
<td>48</td>
<td>124</td>
<td>50</td>
<td>152</td>
</tr>
<tr>
<td>(KPM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std.5 Textbooks</td>
<td>36</td>
<td>168</td>
<td>93</td>
<td>100</td>
<td>52</td>
<td>90</td>
<td>20</td>
<td>68</td>
<td>25</td>
<td>40</td>
<td>19</td>
<td>58</td>
<td>50</td>
<td>130</td>
</tr>
<tr>
<td>(KPM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std.6 Textbooks</td>
<td>48</td>
<td>150</td>
<td>94</td>
<td>101</td>
<td>60</td>
<td>72</td>
<td>20</td>
<td>68</td>
<td>15</td>
<td>35</td>
<td>39</td>
<td>80</td>
<td>50</td>
<td>117</td>
</tr>
<tr>
<td>(KPM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std.7 Textbooks</td>
<td>48</td>
<td>150</td>
<td>82</td>
<td>98</td>
<td>54</td>
<td>92</td>
<td>15</td>
<td>70</td>
<td>20</td>
<td>40</td>
<td>49</td>
<td>70</td>
<td>50</td>
<td>120</td>
</tr>
<tr>
<td>(KPM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std.8 Textbooks</td>
<td>30</td>
<td>90</td>
<td>105</td>
<td>90</td>
<td>90</td>
<td>20</td>
<td>66</td>
<td>20</td>
<td>40</td>
<td>66</td>
<td>66</td>
<td>50</td>
<td>16</td>
<td>134</td>
</tr>
<tr>
<td>(KPM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers Guide</td>
<td>12</td>
<td>12</td>
<td>5</td>
<td>10</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>19</td>
<td>19</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>(KPM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalkboard Instruments</td>
<td>4</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dusters</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coloured Chalk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felt-Pens</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charts</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Models</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radios</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Pupils Desks</td>
<td>500</td>
<td>663</td>
<td>250</td>
<td>260</td>
<td>197</td>
<td>197</td>
<td>140</td>
<td>171</td>
<td>90</td>
<td>100</td>
<td>145</td>
<td>230</td>
<td>300</td>
<td>340</td>
</tr>
<tr>
<td>Volume Measures</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weights</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulletin Boards</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematical Geometrical Sets</td>
<td>20</td>
<td>66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graph-Books</td>
<td>66</td>
<td>316</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where X = Number of items in the school
Table 24 above indicates that all the schools in the study had Kenya Primary Mathematics (KIE) textbooks. However no school had enough textbooks. Chalkboard instruments are very important in the teaching of Geometry. But from the table it can be seen that only 25% of the schools were having them. The same applies to coloured chalk where only 12.5% of the schools indicated that they had them.

Indeed there was a shortage of all the items indicated in the checklist of resources in all schools.

4.5 CONCLUSION FROM THE TEACHERS' QUESTIONNAIRE AND CHECKLIST OF RESOURCES

In this section, the researcher drew conclusions on the research hypotheses (see Section 1.3) based on the results from the teachers' questionnaire and the checklist of resources. The results are discussed below.

4.5.1 ACADEMIC AND PROFESSIONAL QUALIFICATIONS

The general null hypothesis stated: "Academic and professional qualifications have no significant contribution to the problems faced by upper primary mathematics teachers".
Academic Qualification

From Section 4.2.3 it was seen that 71.64% of the teachers had completed four years of secondary education; whereas 20.9% had gone up to form six. 77.6% of these teachers had passed mathematics (Section 4.2.4). Indeed all the teachers indicated common problems irrespective of their academic qualification (Section 4.2.20).

Conclusion

The sub-hypothesis "Academic qualification has no significant contribution to the problems faced by the upper primary mathematics teacher" was accepted.

Professional Qualification

From section 4.2.5., it was seen that 97.01% of the teachers had undergone professional training in the TTCs. From section 4.2.20., it can be seen that most teachers have common problems irrespective of their professional qualifications.

Conclusion

The sub-hypothesis "Professional qualification has no significant contribution to the problems faced by the upper primary mathematics teacher" was accepted.
4.5.2 TEACHING EXPERIENCE, RATE OF TRANSFERS AND TEACHING LOAD

The general null hypothesis stated:
"Teaching experience, rate of transfer and teaching load have no significant contribution to the problems faced by the upper primary mathematics teachers".

Teaching Experience

From Section 4.2.2. it was seen that 67.1% of the teachers were above 31 years of age. From Section 4.2.11., it was seen that 85.08% of the teachers had taught for five or more years.

Conclusion

The sub-hypothesis "Teaching experience has no significant contribution to the problems faced by the upper primary mathematics teacher" was accepted.

Rate of Transfer

From Section 4.2.12., it was observed that 71.64% of the teachers had not been transferred since January 1990. Indeed 70.63% of the teachers had taught for three or more years in the schools they were teaching at that time.
Conclusion

The sub-hypothesis "Rate of transfer of teachers has no significant contribution to the problems faced by the upper primary mathematics teacher" was accepted.

Teaching Load

From Section 4.2.8, it was observed that 88.06% of the teachers had a teaching load of 35 or more periods per week. 65.67% and 82.09% of the teachers indicated that they had no adequate time to plan their lessons and mark pupils work respectively (Section 4.2.10). From Section 4.2.20, 23.88% and 49.25% of the teachers regarded large classes and teaching load respectively as some of the major problems faced by the upper primary mathematics teacher.

Conclusion

The sub-hypothesis "Teaching load has no significant contribution to the problems faced by the upper primary mathematics teacher" was rejected.

4.5.3 AVAILABILITY OF MATHEMATICS TEXTBOOKS AND OTHER TEACHING RESOURCES

The null hypothesis stated:

"Availability of mathematics textbooks and other teaching resources has no significant contribution to the problems faced by the upper primary mathematics teacher"
From Section 4.2.20., it was observed that 86.57% of the teachers regarded lack of resources as one of the major problems faced by the mathematics teacher. 98.49% of the teachers indicated that there was a shortage of textbooks in their schools (Section 4.2.17); whereas 89.55% of the teachers indicated that they found teaching aids in their schools inadequate.

Conclusion

The null hypothesis "Availability of mathematics textbooks and other teaching resources has no significant contribution to the problems faced by the upper primary mathematics teacher" was rejected.

4.5.4 ATTITUDE TOWARDS MATHEMATICS

The null hypothesis stated that: "The attitude of mathematics teachers towards mathematics has no significant contribution to the problems faced by the upper primary mathematics teacher".

From Section 4.3.2., it was observed that 80.6% of the teachers considered the statements favourably. All the respondents (100%) scored more than 64 points (Section 4.3.3.). Thus all the teachers in the study had positive attitudes towards mathematics.
Conclusion

The null hypothesis "Attitude of the mathematics teachers towards mathematics has no significant contribution to the problems faced by the upper primary mathematics teacher" was accepted.

4.5.5 ENGLISH AS A MEDIUM OF INSTRUCTION

The null hypothesis stated:
"English as a medium of instruction has no significant contribution to the problems faced by the upper primary mathematics teacher".

From Section 4.2.19., it was observed that 83.58% of the teachers indicated that they experienced problems when using English as a medium of instruction. Indeed 49.25% of the teachers considered language difficulties as one of the major problems faced by the primary mathematics teacher (Section 4.2.20).

Conclusion

The null hypothesis "English as a medium of instruction has no significant contribution to the problems faced by the upper primary mathematics teacher" was rejected.
CHAPTER FIVE

SUMMARY, IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

5.0. INTRODUCTION

This study was conducted in fourteen primary schools within Ndia Division of Kirinyaga District. The aim of the study was to survey the problems that are faced by upper primary teachers in teaching mathematics. In this chapter, the researcher will give a summary of his findings, implications of the study, and suggestions for further research.

5.1 SUMMARY OF FINDINGS

From the analysis of the data collected, the researcher came up with the following findings regarding the problems that are faced by primary school teachers in teaching mathematics in upper primary classes in Ndia Division:

(1) Most teachers of mathematics had a strong pass in mathematics at O-Level.

(2) The majority of the teachers had undergone professional training in the Teachers' training colleges.

(3) Inservice courses were organised regularly although not all the teachers had attended them.
(4) The majority of the teachers were not satisfied by the professional assistance they received from the TAC tutors.

(5) Most teachers were overloaded since they taught more than 35 periods per week. Thus the teachers felt that they had inadequate time to plan lessons and mark pupils' assignment.

(6) Most of the teachers were experienced since they had taught for five or more years.

(7) The rate of transfer of teachers was quite low. Only a few had been transferred since January 1990.

(8) The number of pupils per class was quite high. In most classes there were over 45 pupils per class. This affected the seating arrangement since pupils had to share the few desks which were available. Sometimes five pupils shared a single desk.

(9) All the teachers had positive attitude towards mathematics. The majority of the teachers with positive statements and disagreed with negative statements.
(10) All schools had an acute shortage of textbooks. In most schools, a textbook was being shared among three or more pupils.

(11) Most teachers did not use any other reference book apart from the class textbook.

(12) There were insufficient teaching aids such as chalkboard instruments, dusters, coloured chalk, and mathematical instruments.

5.2 IMPLICATIONS OF THE STUDY

The following are the implications of this study.

(1) Every teacher should be given an opportunity to attend an inservice course at least once per year. This will help the teacher to keep abreast with new teaching techniques, new knowledge and be well informed about any changes in the curriculum.

(2) TAC tutors in the four zones of Mutira, Inoi, Kiine, and Mwerua should give more regular professional advice to mathematics teachers; especially in the field of making and using teaching aids from the local environment.

(3) The teaching load of mathematics teachers should be reduced so as to allow them extra time to plan
their lessons, mark pupils' work and assist individual pupils. The teachers should also be allowed to specialize in mathematics instead of being given serveral subjects to teach.

(4) The number of pupils per class should be reduced to a reasonable level, preferably less than forty pupils per class. This can be done by building more classrooms and equipping them with enough desks so as to avoid a situation where a desk is shared among four or more pupils.

(5) Teachers, parents and the community at large should work together to make sure that schools have enough textbooks and reference books. Books can be bought through organised "Harambees" instead of the present system where every parent buys books for his/her child.

(6) Teachers should strive to acquire more teaching aids by improvishing what is found in their local environments.

5.3 SUGGESTIONS FOR FURTHER RESEARCH

The researcher felt that the following areas require further research:

(1) A study similar to this but covering both teachers
and pupils should be carried out preferably with a bigger sample.

(2) A research should be carried out to find the effectiveness of the TAC tutors and APSIs in giving professional advice to teachers.

(3) There is need to determine the extent to which over-crowding of pupils in mathematics classes affects the successful teaching and learning of mathematics.

(4) A research should be carried out to determine how fair the Ministry of Education's grants to primary schools in terms of books and other teaching resources are distributed.


10 Editorial, This Education Issue Needs Constant Care, Kenya Times, 26th January 1984, p. 6.


<table>
<thead>
<tr>
<th></th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Morant, R.W. Inservice Education Within the School, George Allen and Unwin, 1981.</td>
</tr>
</tbody>
</table>


APPENDIX A

TEACHERS' QUESTIONNAIRE

INSTRUCTIONS

1. Do not write your name anywhere in this questionnaire.

2. The information you give concerning mathematics teaching will be treated as confidential, so please respond as honestly and accurately as possible.

3. This questionnaire consists of two sections: Section I and Section II. Answer both sections.

SECTION I

Put a tick (✓) in the bracket(s) corresponding to your answers(s).

1. Teacher's sex

   Male [ ]  
   Female [ ]

2. Teacher's age in years:

   Below 24 years [ ]
   Between 25-30 years [ ]
   Between 31-35 years [ ]
   Between 36-40 years [ ]
   Above 40 years [ ]
3. What is the level of your academic qualification?

CPE/KPE/KAPE [ ]
KJSE [ ]
KCE/EACE/KCSE [ ]
KACE/EAACE [ ]
B.Ed/Approved Graduate [ ]
Others Specify: ___________________________

4. What grade did you attain in mathematics as related to your highest academic qualification?

Examination Grade in mathematics
CPE/KPE/KAPE: ___________________________
KJSE ___________________________
KCE/EACE/KCSE ___________________________
KACE/EAACE ___________________________
Others Specify ___________________________

5. What is your highest trained professional qualifications?

Graduate teacher (specify the type of degree) [ ]
Diploma [ ]
S1 [ ]
P1 [ ]
P2 [ ]
P3 [ ]
P4 [ ]
6. Have you attended any inservice course(s) in mathematics?
   Yes [ ]
   No [ ]

7. If yes, how many times have you attended?
   Once [ ]
   Twice [ ]
   Thrice [ ]
   More than three [ ]

8. If you have not attended any inservice course, what are the reasons?
   I have never been invited [ ]
   I was invited but could not get time to attend. [ ]
   I was invited but my attendance was blocked [ ]
   Others [ ]
   Specify: ________________________________

9. How often does the Teachers' Advisory Centre (TAC) Tutors and/or Assistant Primary School Inspectors (APSIs) assist you in mathematics related problems?
   Never [ ]
   Rarely [ ]
   Regularly [ ]
10. What other subjects apart from mathematics do you teach?

11. How many periods do you teach each week?
   - Less than 20 periods
   - Between 20 and 30 periods
   - Between 30 and 40 periods
   - Over 40 periods

12. How many periods of mathematics alone do you teach per week?

13. Do you have enough time during the day for planning mathematics lessons?
   - Yes
   - No

14. Do you have enough time to mark pupils' work in mathematics?
   - Yes
   - No

15. If you don't have enough time as indicated by 13 and/or 14 above what are the reasons for this.
16. For how long have you been a teacher.

Less than one year  [  ]
Between 1-4 years  [  ]
Between 5-8 years  [  ]
Between 9-12 years  [  ]
13 years and above  [  ]
N.B.: Include the years you taught as an U.T.).

17. How long have you taught in your present school?

______________ Months/years (delete as appropriate).

18. Indicate the number of pupils (class-size) in the classes which you teach mathematics.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Number of Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

19. Are you able to assist each pupil during the lesson?

Yes  [  ]
No   [  ]

20. If no, what are your reasons?

__________________________________________
__________________________________________
__________________________________________
21. What mathematics books do the pupils in your class use as textbooks? (Name them).

(a) ____________________ (d) ____________________
(b) ____________________ (e) ____________________
(c) ____________________ (f) ____________________

22. What reference books do you use when teaching mathematics? (Name them).

(a) ____________________ (d) ____________________
(b) ____________________ (e) ____________________
(c) ____________________ (f) ____________________

23. If you use reference books, who provides them?

Provided by the school [ ]
Personal property [ ]
Borrowed [ ]
Provided by Pupils [ ]
Others [ ]
Specify: ____________________

24. Do pupils share mathematics textbooks?

Yes [ ]
No [ ]

25. If yes, how many pupils share one mathematics textbooks?

Two pupils per book [ ]
Three pupils per book [ ]
More than three pupils per book [ ]
26. Do you use teaching aids when teaching mathematics?

   Yes [ ]
   No [ ]

27. Why do you use/not use teaching aids?
   Give reasons:

   __________________________________________________________
   __________________________________________________________

28. Who provides the teaching aids to the school.

   Ministry of Education [ ]
   Bought through school committee/PTA [ ]
   Made by Teachers and/or pupils [ ]
   Provided by other sources [ ]
   Specify: __________________________________________________________
   (Tick as appropriate)

29. The teaching aids available for your use in teaching mathematics is:

   (a) Of good quality [ ]
   (b) Of average quality [ ]
   (c) Of poor quality [ ]

30. Who provides stationery (e.g. exercise books, foolscaps, examination papers, graph papers)?

   __________________________________________________________
31. Are the teaching aids available sufficient for teaching/learning purposes?

Yes [ ]
No [ ]

32. Do you think the quality of the teaching aids affect your teaching of mathematics?

Yes [ ]
No [ ]

(Tick as appropriate).

33. If yes, state how

________________________________________

34. Does the mathematics teacher play any part in the selection and acquisition of teaching materials (including stationery and textbooks)?

Yes [ ]
No [ ]

35. If yes, state the part played by the mathematics teacher.

________________________________________

(a) When introducing a new topic
(b) When pupils are trying to explain their answers.
(c) When using textbooks
(d) Other: Specify

36. If no, state why

________________________________________

(please tick as appropriate)
37. Where are the teaching materials stored?

School store-room [ ]

Headmaster's office [ ]

Library room [ ]

Staff room [ ]

Classroom [ ]

Others [ ]

Specify: ________________________________

(Tick as appropriate).

38. Do you encounter any problems when using English as a medium of instruction when teaching mathematics? (e.g. in trying to explain a certain concept, or difficult term, or defining etc.).

Yes [ ]

No [ ]

39. If yes, when do you encounter the problems?

(a) When introducing a new topic [ ]

(b) When pupils are asking questions [ ]

(c) When pupils are trying to explain their answers. [ ]

(d) When using textbooks [ ]

(e) Others [ ]

Specify: ________________________________

(please tick as appropriate)
40. How many times have you been transferred since January 1990?

Not transferred [ ]
Once [ ]
Twice [ ]
Three or more times [ ]

41. List FOUR problems which you think affect your performance as a mathematics teacher.

(a) __________________________________________
(b) __________________________________________
(c) __________________________________________
(d) __________________________________________
SECTION II

INSTRUCTIONS

1. Please indicate how you feel about mathematics by showing your extent of agreement using the words: strongly agree (SA), Agree (A), Undecided (U), Disagree (D), and strongly Disagree (SD).

2. Put a tick (✓) inside the box of your choice.

3. Note that there is no correct or wrong answers. Just answer honestly.

<table>
<thead>
<tr>
<th></th>
<th>STRONGLY AGREE</th>
<th>AGREE</th>
<th>UN-DECIDED</th>
<th>DISAGREE</th>
<th>STRONGLY DISAGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mathematics is a subject which develops reasoning and it is quite stimulating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Too many lessons each week are devoted to mathematics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Girls are on the whole, incapable of becoming good mathematicians</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>It is always important that pupils understand facts and concepts rather than just memorising, before they do any problems in mathematics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>STRONGLY AGREED</td>
<td>AGREE</td>
<td>UNDECIDED</td>
<td>DISAGREE</td>
<td>STRONGLY DISAGREE</td>
</tr>
<tr>
<td>---</td>
<td>----------------</td>
<td>-------</td>
<td>----------</td>
<td>----------</td>
<td>------------------</td>
</tr>
<tr>
<td>5.</td>
<td>School mathematics is too divorced from reality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Mathematics is the easiest subject to teach</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Pupils who persistently fail in Mathematics should be punished</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Girls are as good as boys in mathematics</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Group-work and discovery methods are too demanding to be of any practical use in mathematics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Mathematics is quite interesting and enjoyable to teach</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>I always lose confidence when I make a mistake in a mathematics class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>The study of mathematics tends to dull the imagination of pupils</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>STRONGLY AGREE</td>
<td>AGREE</td>
<td>UN-DECIDED</td>
<td>DISAGREE</td>
<td>STRONGLY DISAGREE</td>
</tr>
<tr>
<td>---</td>
<td>----------------</td>
<td>-------</td>
<td>------------</td>
<td>----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>13. The teaching of mathematics should be more practical oriented that it is today.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Mathematics teachers should only solve difficult problems in the class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Mathematics thrills me and I like it more than any other subject.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Teaching aids should be used in all mathematics lessons.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Sometimes I am afraid that pupils will ask me questions in mathematics that I cannot answer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Mathematics is quite applicable to our daily life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. I teach mathematics just because I am forced to, otherwise I would rather teach other subjects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. It worries me if I found a pupil had done only few sums in a week in his/her exercise book</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A. CHECKLIST FOR MATHEMATICS INSTRUCTIONAL RESOURCES

TO BE FILLED BY SENIOR TEACHERS/DEPUTY HEADMASTER

Please respond to this checklist accurately and honestly by filling in the information as required. The information will be treated as confidential and will be used purely for educational purposes.

<table>
<thead>
<tr>
<th>RESOURCE</th>
<th>NUMBER IN SCHOOL</th>
<th>RECOMMENDED NUMBER</th>
<th>DEGREE OF ADEQUACY FOR THE WHOLE SCHOOL. TICK (✓) AS APPROPRIATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. A. Class Text book</td>
<td>4</td>
<td></td>
<td>Adequate                      Inadequate       Not available</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. Other books</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESOURCE</td>
<td>NUMBER IN SCHOOL</td>
<td>RECOMMENDED NUMBER</td>
<td>DEGREE OF ADEQUACY FOR THE WHOLE SCHOOL. TICK (✓) AS APPROPRIATE</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>---------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adequate</td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Std. 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Exercise books</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematical sets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers textbooks (guides)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESOURCE</td>
<td>NUMBER IN SCHOOL</td>
<td>RECOMMENDED NUMBER</td>
<td>DEGREE OF ADEQUACY FOR THE WHOLE SCHOOL. TICK (√) AS APPROPRIATE</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>---------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adequate</td>
</tr>
<tr>
<td>Chalkboard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dusters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note books</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalk (coloured)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manila papers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graph papers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Film/Slide projector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tape-Recorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.V./Video</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom chalkboards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pupils chairs/desks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESOURCE</td>
<td>NUMBER IN SCHOOL</td>
<td>RECOMMENDED</td>
<td>DEGREE OF ADEQUACY FOR THE WHOLE SCHOOL. TICK ( ) AS APPROPRIATE</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adequate</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Teacher's Table</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics rooms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid boards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume measures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulletin boards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>