

“ A STUDY OF THE PROBLEMS ENCOUNTERED BY PRIMARY  
SCHOOL TEACHERS IN TEACHING MATHEMATICS IN  
SOME UPPER PRIMARY CLASSES IN  
MAKADARA DIVISION, NAIROBI ”

BY  
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A RESEARCH PROJECT SUBMITTED TO FACULTY OF EDUCATION  
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Muriuki, Fredrick  
*A study of the  
problems encountered*



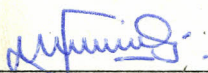
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DECLARATION

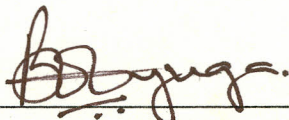
This research project is my original work and has not been presented for a degree in any other University.



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This project has been submitted for examination with my approval as a University Supervisor.



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DEDICATION

This research project work is dedicated to my wife and children whose encouragement and support have been a source of inspiration.

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## CHAPTER ONE

### INTRODUCTION OF THE STUDY

#### 1.1 Background

The primary school mathematics curriculum may be regarded as having undergone more changes than any other curriculum in Kenya primary schools over the last two decades. The single significant revolution in the mathematics curriculum is that which brought about the change from "traditional" mathematics to "modern" or "new" mathematics.

Eshiwani G. (1981 p. 8) gives a brief history of a new mathematics in Kenya: In 1961, a group of African, American and European educators felt that curriculum reform in mathematics in United States and Europe was sufficiently advanced to make a positive contribution to African education. A programme which came to be known as African Mathematics programme (later called the Entebbe Mathematics Series) had its real beginning in June 1962 when a mathematics workshop was held at Entebbe in Uganda.

The main aim of the African Mathematics Programme (AMP) was to produce texts in modern mathematics for primary schools, secondary schools and teachers' training colleges. The AMP had a considerable influence on the teaching of mathematics throughout most English-

speaking Africa. It proved to be a real stimulus for modern Mathematics in many African countries. By mid-1960's several countries in Africa were experimenting with the texts produced by the AMP.

In Kenya, a decision was taken in 1964 to begin a long term project to develop a new series of mathematics texts for use in Kenya primary schools based on the Entebbe mathematics series. In 1965, each class from standard one to seven was to use the corresponding Entebbe series textbooks awaiting the replacement with experimental Kenya texts which could lead to a Kenya series. The project proceeded more or less as planned until 1968 but 1969 witnessed the experimental series being stopped.

In January 1971, a decision was taken to extend the new series, then named Kenya Primary Mathematics (KPM) to all schools in Kenya. The Kenya Primary Mathematics textbook had to be written hurriedly and passed on to schools. It is worth noting that traditional mathematics was divided into three compartments: arithmetic geometry and algebra. The content in the KPM consisted of more than 60 per cent of the topics from the traditional mathematics. There were few 'new' topics such as sets, bases, probability and statistics, transformation geometry and clock arithmetic. It should be pointed out, however, that these topics are not new in the world

of mathematics. The only thing that was new was that they had moved down the curriculum ladder from higher institutions of learning to secondary and primary schools.

The teaching of new mathematics in Kenya was clouded with controversy. It was argued that modern mathematics was irrelevant and emphasized concept development at the expense of acquisition of computational skills. His Excellency President Moi himself ordered that it be phased out from January 1981. Modern mathematics was then replaced by the so called "Appropriate" mathematics which existed until the introduction of 8:4:4 education system in 1984.

According to Eshiwani (1981 p. 9), these were some of the criticisms of the new mathematics programme:

- (a) The new mathematics syllabus and textbooks used were far too difficult for the average child and the content was extremely demanding to both the student and the teacher.
- (b) The mathematics taught had little relevance to the real world.
- (c) Symbolism was overdone in Kenya primary mathematics textbooks.

- (d) The conceptual emphasis was so great that computational skills were neglected.
- (e) The primary school syllabus was overloaded. Most teachers complained that there was so much work to be covered, that they had no time to try out new techniques in their teaching.
- (f) The language used in KPM textbooks was generally difficult for most pupils. This led to inadequate understanding of the subject matter.
- (g) There was no significant in-service training programmes for the teachers.

The introduction of Appropriate mathematics and the current 8:4:4 system of education were meant to overcome these shortcomings. However, there are still complaints that the school syllabus is overloaded. Teachers complain that there is too much work to be covered. Parents complain that their children are being overworked and have no time to play. Teachers complain of inadequate in-service training offered. Therefore the researcher felt that there was need to review some aspects of primary school mathematics curriculum. This research study addressed itself to problems that teachers encounter in teaching mathematics. The researcher investigates the

problems of modern mathematics that are still persistent in the 8:4:4 mathematics curriculum. The study also unearths other problems in teaching of primary school mathematics.

## 1.2 The Problem

The performance of pupils in Kenya Certificate of Primary Education (KCPE) mathematics has not been satisfactory at all. This can be confirmed by Kenya National Examination Newsletter (1990). The average mark in 1989 KCPE mathematics paper was 19.17 marks and the highest possible mark was only 49. In the same year the performance of mathematics was the poorest compared to other subjects at KCPE.

This poor performance in mathematics led to this research study, because the researcher felt that teacher related problems could have contributed significantly to the results above. These problems could arise from inadequate academic and professional qualifications of teachers, unavailability of teaching resources, inadequate in-service training, just to mention a few. Since performance in mathematics country-wide has been poor, it can be inferred that performance in Makadara Division, Nairobi has been equally poor.

## 1.3 Objectives of the Study

The purpose of this research study is to un-

earth the problems encountered by teachers of mathematics in primary schools. The researcher investigates whether the problems arise from unavailability of teaching resources, teaching load, lack of professional development, poor academic and professional qualifications or from ineffective teaching methods.

The following constitute the main objectives of the study.

- (i) To determine the academic and professional qualifications of teachers of mathematics in general
- (ii) To determine the average teaching load of teachers of mathematics.
- (iii) To find out whether teachers of mathematics are involved in professional development activities such as attending in-service courses, seminars or being members of mathematics panels.
- (iv) To determine the ratio of pupils to teachers.
- (v) To determine the teaching methods commonly used by teachers of mathematics.
- (vi) To investigate the availability, adequacy, relevance and appropriateness of the textbooks used in primary schools.
- (vii) To investigate the availability of the teaching and learning aids in the primary schools.

#### 1.4 Significance of the Study

The researcher was convinced that the finding obtained from this study is of great help to curriculum developers, Kenya Institute of Education (K.I.E.) and the Teachers' Advisory Centre tutors.

Once the curriculum developers are made aware of the problems related to 8:4:4 primary school mathematics programme they can make the necessary curriculum changes. The problems could arise due to the broadness of the curriculum, relevance and suitability of the content and also due to time allocated for its coverage.

The K.I.E. will also find the results useful in that, there would be need to re-assess the appropriateness of the recommended textbooks or assess some other books that seem to be popular with teachers.

The results could also be of interest to Teachers' Advisory Centre tutors. They can use the findings of the study to improve the services offered in these centres. The tutors can help the teachers to improvise teaching aids.

#### 1.5 Limitations of the Study

Like many other studies, this one has its own limitations:

- (i) The study was confined to Makadara Division of Nairobi. This being an urban area will not allow for wider generalization of the findings to cover the rural areas, necessarily.
- (ii) The researcher restricted himself to the problems which were related directly to teaching of mathematics only.
- (iii) Due to financial and time constraint the study was limited to within a few schools in Makadara Division, Nairobi.
- (iv) Finally, there was no method by which the researcher could have determined the honesty and the accuracy of the responses given by the respondents.

However, although the sample was not very large, the researcher felt that the research findings can be generalizable to other areas of the country particularly the urban centres.

## 1.6 Abbreviations and Definitions of Terms

C.P.E. stands for "Certificate for Primary Education." This was the examination that was, until 1983, done at the end of 7 years of primary school education.

K.J.S.E. stands for "Kenya Junior Secondary Examination." This is the examination that used to be done after two years of secondary school education.

K.C.E. stands for "Kenya Certificate of Education." This is the examination that is done after four years of secondary school education.

K.A.C.E. stands for "Kenya Advanced Certificate of Education." This examination used to be done after six years of secondary school education.

P1 stands for "Primary Teacher One." This is a college trained teacher for two years and whose minimum academic qualification is K.C.E. Division 3.

P2 stands for "Primary Teacher Two." This is a college trained teacher for two years and whose minimum academic qualification is K.J.S.E or K.C.E. Division 4.

S1 stands for "Secondary Teacher One" after training for three years and whose minimum academic

qualification is K.C.E. Division  
one.

UT stands for "Untrained Teacher."

Professional Development: Professional develop-  
ment involves activities that  
help the teacher to grow in his  
teaching profession. These  
activities include attendance of  
in-service courses and seminars,  
being a member of a mathematics  
panel etc.

Grading in K.C.E. Each subject is awarded a grade.  
1 and 2 stands for distinction,  
3-6 credit pass, 7 and 8 weak  
pass and 9 stands for fail.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This study has been promoted by the investigators concern about the poor performance in mathematics in our primary schools. Performance in mathematics has not been satisfactory for many years. Many factors have been found to influence performance. They range from teaching methods, availability of teaching resources, qualification of teachers, the school environment, home and cultural background and many more.

The researcher limited himself to a few of these namely: academic and professional qualification, pupil/teacher ratio, in-service training and education, teaching methods and the availability and appropriateness of the textbooks.

#### 2.2 Training and Qualification of Teachers

According to Eshiwani G. (1985 p. 5) qualification of a teacher is a very important indicator of the quality of education provided. The training of primary school teachers in Kenya has not kept up with the pressing demands for them in recent years following the tremendous growth in primary school enrolment. In 1980, 70% of the teachers in Kenya were trained while 30% were untrained. In 1981, the respective figures were 66% trained and 34% untrained. The reduction in the

percentage of trained teacher could have been caused by recruitment of more untrained teachers, retirement or resignation of trained teachers. In the two years, the majority of trained teachers were Primary Teacher Two (P2's). The status today need determination.

According to Sidhu K.S. (1982 p. 156), teachers without proper qualification and proper training, fail to do justice to the subject they are teaching. An adequate high qualification of the teacher develops self-confidence in the teacher and serves as a source of inspiration to his/her students. Professional training should help the teacher to attain desirable standards in teaching. The teacher must possess knowledge of, and insight into the processes of mathematics.

The National Committee on Education Objectives and Policies (N.C.E.O.P) of 1976 was equally concerned about the large force of untrained primary school teachers who, the commissioners felt, had either to be trained or phased out and replaced by trained teachers. The N.C.E.O.P. observed that the primary school teacher force in the country had 35,000 teachers who had no training in teaching methodology and many of them 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 (p. 106).

This research study has attempted to establish the professional and academic qualification of teachers of mathematics in Makadara Division, Nairobi.

### 2.3 Ratio of Pupils to Teachers in a Class

An effective classroom teacher is one who is able to detect and attend to the problems of individual pupils. But then, this can only be possible if the the number of pupils per class is small enough to be handled by one teacher in a given lesson.

Eshiwani G. (1985, p.2) was of the opinion that 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 enabling teachers to pay more attention to individual pupils.

According to the Encyclopedia of Education (1971, 2 p. 157) studies have shown that pupils and teachers favoured small class size. Students felt that teaching was more effective in small classes, that teachers gave them personal attention and the grades were more valid. Teachers felt that teaching was more effective and they were able to give students more personal attention. We need to determine, therefore, the Kenyan situation. This study has precedingly focussed on Makadara Division.

Sidhu K.S. (1982 p. 158) claims that large class size is a problem. No individual attention can be paid and

it becomes difficult for the teacher to establish close contacts with the students. The teacher cannot easily judge the capacities of the individuals. This problem can be solved by limiting the number of students in each class to a manageable level.

#### 2.4 In-service Training and Education

Morant R. (1981 p. 3) suggests a general statement indicating the purpose of in-service education.

"This is that in-service education aims at widening and deepening teachers' knowledge, understanding and expertise (including skills, techniques and power of judgement) with respect to their professional work, by means of activities designed primarily to attain this purpose."

Thus, in-service training and education starts by helping teachers to examine their existing practices in schools in a critical manner, possibly with the help of other people working in school or outside it. This will enable them to identify their immediate problems and needs. As a result of this preliminary work, they should be in a position to take action in meeting these needs.

The Encyclopedia of Education (1971 9 p. 79) asserts that in-service training and education is designed to promote the continuous development of the teacher after he enters the teaching profession by providing planned and systematic instruction within an educational setting. The need for further study is directly related

to the ability of a teacher to perform his teaching tasks. The more the nature of his role changes the more frequently the teacher must receive in-service education. An experienced teacher may need such added training because of a change in his assignment, for example, the introduction to the curriculum of a new subject matter or technique such as the new mathematics.

The primary school mathematics has witnessed many curriculum changes for the last two decades. There was traditional mathematics which was later replaced by the new mathematics programme. Thereafter the appropriate mathematics programme was born and at present there is the 8:4:4 mathematics curriculum.

For any curriculum change or innovation, it is necessary to prepare teachers for it. This implies that in-service education and training are very essential for the effective implementation of the change or innovation in the curriculum.

A handbook on In-service Teacher Training in Developing Countries of the Commonwealth (1977 p. 8) asserts that;

"innovations that have been introduced as a result of curriculum development have left many ill-equipped to implement them without further training."

According to A Review of In-service Teachers Training in Kenya (1980, 1 p. 1) there is an urgent need for upgrading teachers to cope up with the new development

in methodology, content and the use of new teaching materials to be able to maintain effective classroom learning. Both trained and untrained teachers could attend courses meant for updating them with a new curriculum or identified problem area in the currently used curriculum. When innovations are introduced into the system, they are only proposals for change, but to achieve their intended effects, they must be implemented. The problem is that if teachers are not properly given in-service for any curriculum change, the whole innovation would be shortlived or never implemented.

It is due to the importance of in-service training and the 8:4:4 mathematics curriculum, that the researcher felt the necessity to investigate whether teachers of mathematics have been given enough in-service training to cope up with the needs of 8:4:4 primary mathematics curriculum.

## **2:5 Teaching Methods**

A variety of teaching methods and techniques can be used by teachers of mathematics to make their lessons easy to understand. Different teaching methods assist to make pupils of different learning abilities understand the content of the subject easily.

The researcher intended to discuss the following teaching methods: discovery, discussion, lecture and question/

### 2.5.1 Discovery Method

According to Sidhu, K.S. (1982 p.110) discovery method involves finding out by the pupil. It demands self-activity or self-education on the part of the learner. The teacher's job is not to solve problems for the pupil, but to enable the pupil to solve problems for himself.

Bell, W. (1983) claimed some advantages of discovery method as follows:-

- (a) it ensures meaningful learning, since the pre-requisite knowledge must be activated before the discovery activity can progress.
- (b) it presents situations in the same ways as those in which learning will need to be used subsequently.
- (c) it promotes the learning not only of the principle itself but of the general strategies for the investigation of problems.
- (d) if the discovery is successful, it is highly motivating.

The general conclusion is that discovery is better for retention and for transfer to new situa-

tions. This refers to guided discovery since free discovery would be unlikely to be very successful. In fact the closer the guidance, the greater the chance of successful discovery but the smaller the opportunity to develop personal strategies of inquiry (p. 171-176).

According to the report of 1972 UNESCO publication, there is evidence, that discovery or inquiry-oriented teaching techniques are successful if the learner is allowed to speculate, make errors without embarrassment, learn from contradictions or inconsistencies and to produce and experience growth of mathematical ideas in a firsthand fashion. On the other hand, discovery learning is bound to be guided (p. 100).

Nevertheless, discovery method has also some limitations. These are some of the limitations:

- (a) It is a slow method. Too much time is taken up by investigation.
- (b) In early stages, the child needs guidance and hints. If the teacher does not give proper guidance, the child may get discouraged.
- (c) The method presumes small classes, because it demands individual attention on the part of the pupil by the teacher.

However, whatever be the method of teaching, the guiding principle, should be the adoption of discovery approach. The question is "Do primary school teachers use it adequately?"

### 2.5.2 Lecture Method

Dean, P.G. (1982 p. 75) defines lecture method as an expository method which transmits information in one direction only, which is from the teacher to the pupils through speech. Teacher defines terms, expressions or symbols, breaks them into simple components which are explained and finally summarises.

Mukuni (1986, p. 31) claims that lecture method, taken in isolation, like other modes of instruction has many weaknesses, for example a lecture on a complex mathematical principle over a long period of time to slow learners can hardly be considered effective. However, it could be used very effectively by the teacher while dealing with complex mathematical language and the structure of higher level concepts.

Sidhu, K.S. (1982 p. 104) claims that the lecture method suits neither the subject nor the learner. It is an informational method which goes against independent and original thinking of the learner. There is no student participation in the learning process. Very few mathematical topics lend themselves to effective treatment by this method. There is a rapid and hurried flow of ideas in a lecture. Everything may not be comprehended by young learners.

The researcher was of the opinion that lecture method cannot be used effectively in teaching mathematics in primary schools. This method is likely to succeed in university where the lecturer is dealing with large classes of mature students. The extent to which primary teachers use this method is of interest.

### 2.5.3 DISCUSSION

James (1958 p. 17) is of the opinion that discussion in mathematics is very important. The wise teacher uses it to a great extent in formal lessons. Through discussion at the start of a piece of work, the real issues are brought out more clearly. Discussion as the work proceeds and discussion at its conclusion are both necessary to clarify what has been done.

Schiminke (1973 p. 73) claims that a teacher is making a discussion more when he is asking questions and encouraging students to do the same, there is verbal interaction of an inquiry-response type. This type of move is known to be effective for introducing new topics, conducting review, guiding discovery and clarifying ideas.

According to Mukuni (1986 p. 32) discussion as a mode of instruction refers to pupil to pupil talk with occasional intervention by the teacher. The participants contribute information and ideas without filtering them through the leader of the group every time. The discussion is limited to time available and ideally the

size of the group should be about six to ten pupils. These pupils work in groups to explore and discover and test rules and patterns from problems presented by the teacher. They work together from past experiences through exchange, to develop new ideas and in this way enhance their self-confidence in dealing with mathematical situations in a relaxed atmosphere. The role of the teacher is to help in setting and directing this situation so that the discussion does not become one sided-affair.

The researcher felt that discussion in mathematics is very important because it enhances understanding. Discussion is necessary for introducing new topics, conducting review, guiding discovery and clarifying ideas. The researcher felt that teachers of mathematics should use this method in their lessons.

The researcher study, therefore, attempted to investigate whether teachers of mathematics in primary schools frequently use discussion in their lessons.

#### **2.5.4 Question/Answer Method**

According to Mukuni (1986 p. 34), in question/answer mode of instruction, the teacher directs the pupils' thinking through a series of leading and thought provoking questions in an attempt to achieve desired objectives. Through this mode, exploration and discovery of generalizations, patterns, alternative methods of proof, and applications of mathematics can be done.

Alone or in combination with other modes the question/answer mode of instructor account for the most used instructional strategies in mathematics classrooms.

The researcher felt that question/answer mode of instruction would be very effective if combined with discussion and discovery methods.

In conclusion, Dean, P.G. (1982, p. 39) reports that pupils receive a good mathematical education from a teaching style which includes:

- (a) a combination of a least two teaching methods during any lesson and
- (b) a progressively changing combination of methods during a period of term or more.

Each teacher should have decided on general plan which shows or implies, his chosen combination of teaching methods and the ways in which that combination changes as the pupils become more mature.

The researcher has discussed some of the teaching methods used in teaching mathematics. Advantages and limitations of these methods have been looked at. However, combinations of these methods: discovery, discussion and question/answer methods would be very effective in teaching primary school mathematics. The research study, therefore, attempts to investigate the

commonly used methods in teaching primary school mathematics.

## 2.6 Appropriateness (Language and Content) of a Textbook

The mathematics textbook is a major factor in determining what mathematics topics are taught and how they are taught. A mathematics book has often dictated the scope, the sequence, and even the pace of mathematics programme. However, the mathematics curriculum should not be determined by the text, rather the text should be selected on the basis of prior curriculum decisions.

Sidhu (1982, p. 151) lists a few points on the importance of a textbook.

- (a) It serves as a reference book for a teacher
- (b) It is a concise source of material for reviews. It enables the pupils to acquire needed information speedily. At revision stage, with textbook at his disposal, the student can work independently of the teacher.
- (c) A good textbook furnishes a large collection of well selected and graded exercises in the teaching of mathematics.

Johnson and Rising (1972) claims that a mathematics textbook has a unique role in the classroom. These reasons are:

- (i) Direct experience, visual aids and classroom instruction cannot provide all the instruction necessary. Some of this instruction must be covered by reference to a textbook.
- (ii) Many schools are limited in resources such as library books, concrete and visual learning aids, community resources; and so the text provides the basic and sometimes the only resource.
- (iii) Learning mathematics depends on the mastery of concepts and skills. Students may grow in this mastery by performing the exercises of the text.
- (iv) Mathematics requires a sequential study treatment and the textbook provides a useful aid to this approach. (p. 370).

According to Taiwo, C.O. (1974 p. 46) books are essential resources for learning mathematics. The two great storehouses for the accumulation and transmission of mathematic knowledge have been people and books. There is a place for books on modern methods of teaching mathematics as well as modern content and for background books which could enrich the mathematical education of pupils and teachers.

Johnson and Rising (1972) noted that if a mathematics textbook is to serve its proper function it needs qualities such as the following:

- (a) The topics forming the content are those that will attain the objectives of the course.
- (b) The content is appropriate in terms of interest and difficulty.
- (c) The topics are in harmony with current curriculum emphasis.
- (d) Language in the narrative is readable and comprehensible.
- (e) The abstraction and symbols are made meaningful.
- (f) The language is interesting and thought provoking.
- (g) The definitions and explanations use only those terms that pupils can be expected to understand (p. 372).

Sidhu (1982 p. 153) avers that the qualities of a good textbook are as follows:-

- (i) It should be well illustrated. There should be diagrams and sketches at appropriate situations.
- (ii) The language should be simple and clear.
- (iii) There should be a sequence and consistency in the organization of the subject matter.
- (iv) The symbols and terms used must be those which are popular so that there is no confusion. All the new terms should be clearly and accurately defined.

The researcher intended to investigate whether the 8:4:4 mathematics textbooks in the primary schools contain appropriate content and language. Besides, they should have most of the qualities afore-said.

## CHAPTER THREE

### RESEARCH DESIGN AND METHOD

#### 3.1 Research Sample and It's Selection

The total population of the study consisted of twenty (20) primary schools in Makadara Division, under the Nairobi City Education. Out of these twenty (20) primary schools, ten (10) schools were selected randomly for the study.

From the ten (10) randomly selected primary schools, teachers of mathematics in the upper primary classes formed the sample of the study. The researcher used five (5) teachers from each school in order to make a total of fifty (50) teachers.

The average number of teachers of mathematics in upper primary classes in each school was five (5). The implication was that, there were one hundred (100) teachers of mathematics teaching upper primary classes in the 20 schools in the Division. Therefore, percentage of sample of teachers of mathematics was about 50%, which was a representative sample.

#### 3.2 Research Instruments

The researcher used the following tools for the collec-

tion of data:

- (a) Teachers' questionnaire - refer to Appendix A
- (b) A checklist of teaching and learning resource  
- refer to Appendix B.

The teachers' questionnaire included information about teachers, primary school mathematics curriculum, teaching methods and resource materials particularly the textbooks.

The checklist included the teaching and learning resources expected to be found in a mathematics department.

### **3.3 Test Administration**

The researcher distributed the questionnaires to each of the ten randomly selected schools and was able to collect all the questionnaires and the checklist of resources after two weeks. The checklist of resources were administered by senior teachers from the ten schools.

After the data had been collected the researcher analysed items in the instruments by use of tables and percentages. After each table, interpretation of the results was presented. Chapter Four (4) has dealt with data analysis and interpretation.

## CHAPTER FOUR

### DATA, ANALYSIS AND INTERPRETATION

#### 4.1 Introduction

The main objective of this study was to investigate the problems encountered by teachers of mathematics in primary school in Makadara Division of Nairobi.

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 observation 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 Teacher Related Variables

Teachers being the implementors of mathematics curriculum are an important variables whose role will greatly affect the teaching and learning of the subject in primary schools. Information concerning their academic and professional qualifications, and day to day work load which are presented below, are some of

the aspects which are expected to influence how effectively and efficiently mathematics will be taught.

#### 4.2.1 Age of Teachers of Mathematics

The intention of question item 1 from the teachers' questionnaire was to depict the age range of teachers of mathematics. Older teachers were expected to be more experienced in teaching mathematics than the younger ones. The younger teachers on the other hand were expected to put a lot of energy in their work. The results of the responses are indicated in table 1.

**Table 1: Number o Teachers Per Age Range**

| Age Range in Years | Number of Teachers | Percentage |
|--------------------|--------------------|------------|
| 20-29              | 9                  | 18         |
| 30-39              | 30                 | 60         |
| 40-49              | 11                 | 22         |
| Above 50           | 0                  | 0          |

The observation that majority of the participants were between 30 and 49 years of age indicated that most teachers were experienced in teaching mathematics, assuming tha teaching normally starts at the age of about twenty.

#### 4.2.2 Pre-service Training

Item number 2 from teachers' questionnaire was

intended to reveal the number of teachers who have had pre-service training in teaching. Pre-service training is essential since it exposes the teacher to more content and methods of teaching effectively.

### Interpretation

The results indicate that 98% of the teachers have had pre-service training. The implication is that mathematics subject does not suffer from lack of trained teachers in Makadara Division of Nairobi.

#### 4.2.3 Academic Qualifications

The researcher intended to show the academic qualification status of teachers of mathematics. Teacher's 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. Table 2 indicates the findings.

**Table 2: Teachers' Academic Qualifications**

| Academic Qualification | Number of Teachers | Percentage |
|------------------------|--------------------|------------|
| K.J.S.E.               | 1                  | 2          |
| KCE/EACE/GCE           | 44                 | 88         |
| KACE/EAACE/HSC         | 5                  | 10         |

### Interpretation

It was found that 88% of the teachers successfully completed four years of secondary school education while 10% had completed four years of secondary school education and two years of higher secondary school education. The results indicate that most teachers in the Division have had reasonable academic qualifications.

#### 4.2.4 Grades Attained in Mathematics

The question item number 4 attempted to find out whether teachers of mathematics had obtained reasonable grades in mathematics in K.C.E. This information would reveal their mathematical ability background. Table 3 indicates the results.

**Table 3: Mathematics Grade Attained by Teachers of Mathematics**

| Grades       | Number of Teachers | Percentage |
|--------------|--------------------|------------|
| Credit (1-6) | 21                 | 42         |
| Pass (7-8)   | 24                 | 48         |
| Fail (9)     | 5                  | 10         |

### Interpretation

The results reveal that 48% of the teachers had

a weak pass in mathematics while 10% had failed. The implication is that 58% of the teachers had a weak mathematical ability background.

#### 4.2.5 Professional Qualification

This study attempted to solicit information about teachers professional qualifications. It is generally assumed that effectiveness in teaching largely depends on the qualification that the teacher has received in the profession. The results are indicated in table 4.

**Table 4: Teachers' Professional Qualifications**

| Qualification | Number of Teachers | Percentage |
|---------------|--------------------|------------|
| Diploma       | 1                  | 2          |
| S1, P1/S1     | 3                  | 6          |
| P1            | 39                 | 78         |
| P2            | 6                  | 12         |
| U.T.          | 1                  | 2          |

#### Interpretation

The table above shows that 78% of the teachers consist of P1's, 12% P2's while 6% were S1 and P1/S1. The findings show that only a small number (2%) of the

participants in the study had not received any form of training in teaching. From this it is quite clear that most teachers in the Division have the required professional qualifications.

#### 4.2.6 Attendance of In-service Training in Mathematics

The question item number 6 was intended to reveal the number of times teachers of mathematics have attended the in-service courses and seminars this year. In-service training helps teachers in keeping abreast with new trends in curriculum development, methodology, resource use, evaluation etc. The analysis of the responses are indicated in table 5.

**Table 5: Frequency of Attendance of In-service Courses**

| Number of Times | Number of Teachers | Percentage |
|-----------------|--------------------|------------|
| Nil             | 17                 | 34         |
| Once            | 23                 | 46         |
| More than once  | 10                 | 20         |

#### Interpretation

66% of the teachers attended in-service courses or seminars while 34% never attended any for the whole year. It is therefore reasonable to conclude that in-

service training has received reasonable attention throughout the year. However, the in-service course should be organized such that all teachers are able to attend.

#### 4.2.7 Reasons for not Attending In-service Training

Question item number 7 was intended to find out why it was not possible for 34% of the teachers to attend any of the in-service courses organized in the Division. Table 6 shows the results.

**Table 6: Reasons for not Attending In-service Programmes**

| Reasons   | Number of Teachers | Percentage |
|---|--------------------|------------|
| Teachers not among those selected                         | 7                  | 41.2       |
| Teachers not aware of the existence of in-service courses | 5                  | 29.4       |
| No in-service course organized                            | 1                  | 5.9        |
| No reason given   | 4                  | 23.5       |

The table above indicates that 41.2% of the teachers failed to attend any in-service course because they were not among those selected to attend. The re-

searcher felt that in-service courses and seminars could be held during the school holidays so that all the teachers could have a chance of attending.

#### 4.2.8 Assistance Received from Nairobi Teachers' Centre

The Teachers' Advisory Centre (TAC) is meant to give assistance to the teachers. It is here where teachers get assistance concerning how to improvise and make good teaching aids. They also get resource materials from there. Question item number 9 intended to find out if the personnel at the centre gave adequate assistance to the teachers of mathematics in the Division.

#### Interpretation

64% of the teachers felt that Nairobi Teachers' Centre was not providing the assistance expected. From this, it is quite clear that the TAC tutors are not effectively playing their role as suppliers of materials and as general advisors.

#### 4.2.9 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 extra time for planning his lesson and marking pupils' work. Table 7 indicates the results.

Table 7: Teachers' Teaching Load Per Week

| Periods per Week  | Number of Teachers | Percentage |
|-------------------|--------------------|------------|
| Over 40           | 35                 | 70         |
| Between 30 and 40 | 12                 | 24         |
| Between 20 and 30 | 3                  | 6          |

The table above indicates that 70% of the teachers were quite overloaded since they taught more than 40 periods per week. The small number of teachers who taught less than 30 periods per week happen to be teachers that are heavily loaded with other responsibilities.

If teachers are expected to teach effectively then their teaching load should be made lighter.

#### 4.2.10 Number of Periods Teachers Taught Mathematics Per Week

Question item number 12 was intended to find out the number of periods each teacher taught mathematics per week. The number of periods will indicate the number of teachers who teach mathematics only. Table 8 shows the findings.

**Table 8: Number of Periods Teachers Taught Mathematics Per Week.**

| Number of Periods | Number of Teachers | Percentage |
|-------------------|--------------------|------------|
| 6 to 8            | 35                 | 70         |
| 9 to 16           | 9                  | 18         |
| Over 16           | 6                  | 12         |

The results show that 70% of the teachers taught between 6 and 8 lessons of mathematics per week. The other group of teachers (18%) taught between 9 to 16 periods per week, while minority group of teachers (12%) taught over 16 periods. From these findings the researcher discovered that the first group of teachers taught only a single class, while the middle group taught two classes and the last group of teachers taught more than two classes. The implication is that only a small number of teachers were allowed to concentrate in teaching mathematics. The researcher feels that more teachers should be allowed to teach mathematics only so that they may have confidence in the subject.

#### 4.2.11 Reflection of Team Work in teaching Mathematics

Question item number 13 was intended to find out whether teachers of mathematics work as a team for the success of the subject in their school. Through

teachers' co-operation the researcher believed that teachers are in the position of helping each other and make teaching effective.

## Results

72% of the primary school teachers in Makadara Division work as a team in their various schools while a small percentage (28%) did not support this idea.

### 4.2.12: Adequacy of the Number of Lessons Per Week and Adequacy of Time to Plan/Mark Lessons/Work.

Question item numbers 14 and 15 intended to find out if teachers had adequate time to plan their lessons and mark pupils' work. Planning in advance is a mark of efficiency, successful teaching and learning.

Question item number 16 was intended to find out whether time allocated to mathematics per week is enough to cover the syllabus adequately in each class.

Table 9 shows the findings

**Table 9: Adequacy of the Number of Lessons Per Week and Adequacy of Time to Plan/Work Lessons/Work**

| Responses       | Adequate Time to Plan |    | Adequate Time to Mark |    | Adequate number of Periods per Week |    |
|-----------------|-----------------------|----|-----------------------|----|-------------------------------------|----|
|                 | Yes                   | No | Yes                   | No | Yes                                 | No |
| No. of Teachers | 7                     | 43 | 7                     | 43 | 19                                  | 31 |
| Percentage      | 14                    | 86 | 14                    | 86 | 38                                  | 62 |

From table 9, 86% of the teachers claimed that they did not have enough time to plan their lessons and mark pupils' work. 62% felt that time allocated to mathematics per week was inadequate. The implication is that the number of periods of mathematics should be increased or teaching load reduced.

#### 4.3. Curriculum

Apart from teacher related problems already discussed, there are also problems related to 8:4:4 primary schools mathematics programme. The problems could arise due to the broadness of the mathematics curriculum, suitability of the content, relevance of the curriculum to the country's needs and also due to time allocated for its coverage. The problems arising from variables mentioned above could have negative effects on the teaching of mathematics.

##### 4.3.1 Broadness and Relevance of the Curriculum and Suitability of the Content

Question item number 17 was intended to explore the feeling of teachers of mathematics about the broadness of the primary school mathematics curriculum. The researcher wanted to find out whether the syllabus could be covered within the time allocated.

Question item number 18 was intended to find out the suitability of the content. When content is unsuitable, it means that the concepts being taught are either too difficult or irrelevant to pupils' lives.

Item 19 was intended to investigate the teachers' opinion on the relevance of the current mathematics syllabus to the country's needs. The table below indicates the findings.

**Table 10: Broadness and Relevance of the Curriculum and Suitability of the Content.**

| Responses       | Curriculum too Wide |    | Curriculum Relevant |    | Content Suitable |    |
|-----------------|---------------------|----|---------------------|----|------------------|----|
|                 | Yes                 | No | Yes                 | No | Yes              | No |
| No. of Teachers | 35                  | 15 | 47                  | 3  | 37               | 13 |
| Percentage      | 70                  | 30 | 94                  | 6  | 74               | 26 |

As the table above indicates, 70% of the teachers felt that mathematics syllabus was a bit broad to be covered within the time given at each level. 74% of the teachers felt that the content was quite suitable and 94% felt that the syllabus was relevant to the country's needs.

The findings indicate that something needs to be done about the broadness of mathematics syllabus so that teachers can effectively cover the syllabus within the time allocated.

#### 4.2.2 Syllabus Coverage

This study was intended to show the number of

teachers who are able to cover a specific percentage of the syllabus within each year in each class. This is important because if teachers are unable to cover the content for each class within each year, it means that topics that are partly covered have to be pushed to the next class. This is a sign of inadequate coverage of the syllabus as it results in an accumulation of left-over topics and this may place a burden on the teachers of the examination classes. The table below expresses the results.

**Table 11: Percentage of Syllabus Covered within the Year.**

| Coverage Percentage | Number of Teachers | Percentage |
|---------------------|--------------------|------------|
| Above 80            | 23                 | 46         |
| Between 60 and 80   | 27                 | 54         |
| Below 50            | 0                  | 0          |

The table above reveals that about 54% of the teachers were only able to cover between 60% and 80% of the content of the syllabus for each given class. These findings indicate that majority of the teachers were unable to cover the content of the syllabus for each level or class. This is a sign of lack of adequate time for syllabus coverage.

### 4.3.3 Teachers' Suggestions on Adequate Syllabus Coverage

The teachers being both translators and implementors of the curriculum would be the ideal people to evaluate its coverage. In the previous question item number 20, the results showed that majority of teachers had found it impossible to cover the syllabus within the time allocated. Item number 21 was intended to portray the teachers suggestions as to how the mathematics syllabus could be adequately covered. Table 12 below indicates the results.

**Table 12: Teachers' Suggestions on Adequate Syllabus Coverage**

| Suggestions  | Number of Responses | Percentage |
|--|---------------------|------------|
| Increase the number of mathematics periods per week.     | 32                  | 41         |
| Reduce the teaching load of teachers of mathematics      | 15                  | 19.2       |
| Pupils should be provided with more supplementary books. | 12                  | 15.4       |
| More in-service courses should be arranged.              | 12                  | 15.4       |
| Content should be reduced by removing certain topics.    | 7                   | 9.0        |

N.B.: Most of the teachers made more than one suggestion. Also note the suggestions have been arranged in the order of importance in the table above starting with the suggestion that was given by majority of teachers.

The findings from the table above tend to suggest that teachers could be going through a lot of difficulties and problems in the coverage of the syllabus.

#### 4.3.4 Class Size

Item number 22 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 and pupils learn more effectively when they are fewer in a class. Small classes are more manageable and they allow easy detection of individual differences. The table below indicates the findings.

**Table 13: Average Number of Pupils in a Class**

| Class Size        | Number of Teachers | Percentage |
|-------------------|--------------------|------------|
| Over 40 pupils    | 29                 | 58         |
| Between 30 and 40 | 19                 | 38         |
| Less than 30      | 2                  | 4          |

The table above shows that 58% of teachers taught classes that had more than 40 pupils while only 4% of the teachers taught classes that had less than 30 pupils. Teaching 30 pupils per class is considered as ideal while a class that has over 40 pupils is considered to be too large for effective teaching.

#### 4.4 Teaching Methods

Poor teaching methods could negatively affect the performance of mathematics in primary schools. It is this in mind, that the researcher intended to find out the commonly used teaching methods. The researcher also intended to find out the factors influencing the choice of those teaching methods.

##### 4.4.1 Rating of Various Teaching Methods

Item number 24 was intended to investigate the rating of teaching methods which are commonly used by teachers of mathematics in primary school. Table 14 indicates the ratings.

**Table 14: Popularity of Various Teaching Methods**

|                                | Very Regularly | Regularly | Less Regularly | Not Regularly |
|--------------------------------|----------------|-----------|----------------|---------------|
| Teacher Lecturing              | 4%             | 6%        | 20%            | 70%           |
| Class discussion or group work | 20%            | 44%       | 30%            | 6%            |
| Discovery method               | 10%            | 22%       | 44%            | 24%           |
| Question/answer method         | 52%            | 40%       | 6%             | 2%            |

Table 14 shows that the most popular method is question/answer method, followed by class discussion, then followed by discovery method and the least popular is lecture method. The researcher feels that the discovery method should be used more frequently because of the reasons given in Chapter 2 page 17.

#### 4.4.2 Factors Influencing the Choice of the Teaching Methods.

Item number 25 was intended to depict those factors that influenced the choice of teaching methods in mathematics. This is important since the teaching method chosen influences the teaching and learning processes of people involved. Factors such as the teaching load, class size, nature of the subject, content of the syllabus and class discipline will influence the teaching method used. The table below indicates the findings.

**Table 15: Rating of the Factors that Influence the Choice of Teaching Methods**

| Factors           | Responses | Percentage |
|-------------------|-----------|------------|
| Teaching load     | 36        | 41.9       |
| Class size        | 23        | 26.7       |
| Content and Scope | 24        | 27.9       |
| Class discipline  | 3         | 3.5        |

The table above shows that the teaching load was the major factor influencing the choice of the teaching methods used. The implication is that if teachers are given a lighter teaching load then they are in a

position of choosing the appropriate teaching method(s).

#### 4.5 Resource Materials

Resource materials play a very important role in teaching and learning of mathematics. Teaching aids help pupils to translate abstract concepts into reality. Lack of teaching aids can have negative effect on teaching of mathematics. The researcher intended to find out about the availability and appropriateness of some resources materials particularly the textbooks.

##### 4.5.1 Popular Reference Books Used by Teachers

Item numbers 26 and 27 were intended to show mathematics reference and textbooks that are popularly 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. The table below gives the results.

**Table 16: Popular Reference Books**

| Reference Books                                   | No. of Teachers | Percentage |
|---|-----------------|------------|
| Primary mathematics (KIE)                         | 47              | 94         |
| Revision mathematics for KCPE by Joe Oconner      | 16              | 32         |
| Upper Primary Mathematics by Malkiat Singh.       | 15              | 30         |
| Preparatory Mathematics by B. Mehta and C. Desai. | 15              | 30         |
| Highway Mathematics by Carey Francis              | 6               | 12         |

The most popular book is Primary Mathematics (KIE). This book has been recommended by the Ministry of Education. The books listed above are also the same books used by pupils as textbooks.

#### 4.5.2 Adequacy and Appropriateness of the Class Text-Books

Item number 29 was intended to find out whether pupils have sufficient textbooks. This is important because lack of textbook would have a negative effect in the teaching and learning of mathematics.

Item number 30 attempted to find out whether the language used in the class textbooks was simple for pupils to follow and understand. The table below gives the findings.

**Table 17: Adequacy and Appropriateness of the Class Textbooks**

| Responses        | Adequate Text-books |     | Simple Language Used. |    |
|------------------|---------------------|-----|-----------------------|----|
|                  | Yes                 | No. | Yes                   | No |
| No. of teachers. | 32                  | 18  | 34                    | 16 |
| Percentage       | 64                  | 36  | 68                    | 32 |

The table above indicates that 64% of the teachers accepted that class textbooks were sufficient and 68%

agreed that the language used in these textbooks was simple enough for pupils to follow and understand.

The implication is that schools in the Division have adequate textbooks.

#### 4.5.3 Availability of Other Teaching Aids

The study attempted to find out the availability of some specific teaching aids in primary schools. This is important because lack of some teaching aids, implies that some topics are not taught adequately and effectively. Table 18 indicates the results.

Table 18: Number of Items Available in Various Schools

| ITEM                   | S C H O O L S           |    |    |    |    |    |    |     |    |    | % of the Schools with the Item |
|------------------------|-------------------------|----|----|----|----|----|----|-----|----|----|--------------------------------|
|                        | A                       | B  | C  | D  | E  | F  | G  | H   | I  | J  |                                |
| Abacus                 | 9                       | -  | 2  | 1  | -  | 2  | 2  | 1   | -  | -  | 60                             |
| Model (Cuboids)        | -                       | -  | 3  | -  | -  | -  | -  | 100 | -  | -  | 20                             |
| Fraction charts        | 9                       | -  | 4  | 2  | 2  | -  | 1  | 1   | -  | -  | 60                             |
| Geometrical sets       | E A C H P E R P U P I L |    |    |    |    |    |    |     |    |    | 100                            |
| Shape recognition kits | -                       | -  | 3  | -  | -  | -  | 2  | 7   | -  | 3  | 40                             |
| Pattern blocks         | -                       | -  | 4  | -  | -  | -  | 2  | -   | -  | -  | 20                             |
| Measuring cylinders    | 7                       | 4  | 2  | -  | -  | -  | 2  | -   | -  | -  | 40                             |
| Weights                | -                       | -  | -  | -  | -  | -  | -  | -   | -  | -  | 0                              |
| Dice                   | -                       | -  | -  | -  | -  | -  | -  | -   | -  | -  | 0                              |
| Clockface              | 18                      | 3  | 1  | -  | -  | 2  | 2  | 2   | 10 | 2  | 80                             |
| Chalkboard             | 24                      | 25 | 25 | 14 | 14 | 28 | 24 | 28  | 24 | 25 | 100                            |
| Chalkboard rulers      | 24                      | 8  | 10 | 8  | 4  | 4  | 24 | 10  | 24 | 25 | 100                            |
| Chalkboard protractors | 12                      | 8  | 4  | 3  | 4  | 2  | 2  | 2   | 12 | 8  | 100                            |
| Chalkboard compasses   | 12                      | 8  | 3  | 4  | 4  | 2  | 2  | 2   | 12 | 8  | 100                            |

The table above indicates that the following items are not available in required quantities in many schools: weights, dice, pattern blocks, model cuboids and shape recognition kits.

## CHAPTER FIVE

### SUMMARY, IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

#### 5.1 Summary of Findings

From the analysis of data collected, the researcher came up with the following findings regarding the problems encountered by teachers of mathematics in Makadara Division of Nairobi.

- (a) As regards teacher related problems the researcher had the following findings:
  - (i) Most teachers of mathematics had attained a weak pass or failed in K.C.E. mathematics.
  - (ii) Not all teachers of mathematics attended the in-service courses organized in the Division.
  - (iii) Nairobi Teachers' Centre was not providing the assistance teachers expected.
  - (iv) Most teachers were overloaded since they taught more than 40 periods per week.
  - (v) Time allocated to mathematics per week was inadequate.

- (b) On problems related to primary school mathematics programme, the researcher had the following findings:
- (i) The mathematics curriculum was too wide to be covered within the time allocated.
  - (ii) Average number of pupils in a class was above 40. Teachers were therefore unable to meet individual needs of every pupil.
- (c) On teaching methods, the research findings indicate that discovery method was not given the weight it deserved because of teachers being overloaded.
- (d) On resources used by teachers, the researcher had the following findings:
- (i) There were sufficient supplies of the textbooks.
  - (ii) There were insufficient teaching aids such as weight, dice, pattern blocks and shape recognition kits.

## 5.2 Implications

The following are the implications of this study:

- (i) Seminars and in-service courses should be organized for both the old and new teachers to keep abreast with new teaching techniques, new knowledge, new skills and thus be well-informed of any curriculum changes.
- (ii) The teaching load of teachers of mathematics should be reduced so as to allow them extra time to plan the lessons, mark pupils' work and assist individual pupils.
- (iii) Teachers who have a better mathematics background should be the ones teaching mathematics i.e teachers who had attained a credit pass in mathematics in K.C.E.
- (iv) Nairobi Teachers' Centre should give more assistance to the teachers in the Division
- (v) Mathematics syllabus was a bit broad to be covered within the time allocated. Therefore, some topics should be removed or the time allocated for its coverage increased.
- (vi) The class size should be reduced to a reasonable level, preferably less than 40 pupils per class.
- (vii) Teachers should use discovery method more regularly. This would be possible if their teaching load is reduced and mathematics periods increased.

- (viii) Schools should strive to acquire more teaching aids or improvise them and use them effectively.

### 5.3 Suggestions for Further Research

The researcher felt that the following areas require further research:

- (a) A study similar to this one covering a larger sample should be carried out preferably in rural Kenya.
- (b) A research should be carried out to find out whether professionally qualified teachers of mathematics, whose mathematical ability background is limited affect the performance of mathematics in K.C.P.E.

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## APPENDIX A

TEACHERS' QUESTIONNAIRE

Do not write your name anywhere on this questionnaire. The information you give concerning mathematics teaching will be treated as confidential. Your contribution towards the improvement of mathematics teaching in primary schools will greatly be appreciated so please respond as honestly and accurately as possible.

Put a tick [✓] in the brackets corresponding to your answer.

1. Teachers sex:

Male [ ✓ ]

Female [ ]

Teacher's age in years: .....

2. Are you a trained teacher?

Yes [ ]

No [ ]

3. What is the level of your academic qualification?

(a) CPE/KPE/KAPE [ ]

(b) K.J.S.E. [ ]

(c) K.C.E./E.A.C.E/H.S.C.E. [ ]

- (d) B.Ed./B.SC./B.A./Approved graduate teacher [ ]
- (e) K.A.C.E./E.A.A.C.E./H.S.C. [ ]

4. Grade attained in mathematics as related to your academic qualification above e.g.

Principal A

Credit 3

5. What is your professional qualification?

- (a) Graduate teacher [ ]
- (b) Approved/graduate [ ]
- (c) Diploma [ ]
- (d) S1 P1/S1 [ ]
- (e) P1 [ ]
- (f) P2 [ ]
- (g) P3 [ ]
- (h) P4 [ ]
- (i) Untrained teacher (U.T.) [ ]

6. How many times have you attended in-service course(s) in mathematics this year? .....

7. If you have not attended in-service course(s) at all, write the major reasons for this failure.

.....

.....  
.....  
.....

8. Is there a Teachers' Advisory Centre (T.A.C.)  
in your Division?

(a) Yes [ ]

(b) No [ ]

9. Do the personnel at the T.A.C. in your Division  
frequently assist your school in mathematics  
related problems?

(a) Yes [ ]

(b) No [ ]

10 Do you teach any other subjects apart from  
mathematics?

(a) Yes [ ]

(b) No [ ]

11 What is your teaching load per week?

(a) Less than 20 periods [ ]

(b) Between 20 and 30 periods [ ]

(c) Between 30 and 40 periods [ ]

(e) Over 40 periods [ ]

12 Indicate the number of periods you have

for mathematics alone per week

..... periods.

13 Do all teachers of mathematics work as a team for the success of the subject in your school?

(a) Yes [ ]

(b) No [ ]

14 Do you have enough time during the day for planning mathematics lessons?

(a) Yes [ ]

(b) No [ ]

15 Do you have enough time to mark pupils' work in mathematics?

(a) Yes [ ]

(b) No [ ]

16 Do you consider the number of periods, allocated to mathematics adequate?

(a) Yes [ ]

(b) No [ ]

17 Is primary mathematics syllabus just enough to be covered within the time given at each level or class?

(a) Yes [ ]

(b) No [ ]

18 Is the content of the primary mathematics syllabus suitable for the primary schools pupils?

(a) Yes [ ]

(b) No [ ]

19 What would you say about the relevance of the content of mathematics syllabus to the country's needs?

(a) Very relevant [ ]

(b) Relevant [ ]

(c) Not relevant [ ]

20 By the end of the year, about what percentage of the syllabus do you cover in teaching your class in mathematics?

(a) Below 50% [ ]

(b) Between 60% and 80% [ ]

(c) Above 80% [ ]

21 From your own experience as a mathematics teacher suggest ways which you recommend that can help you and other teachers in covering the mathematics syllabus more effectively.

(a) .....  
 .....

(b) .....  
 .....

22. Which classes do you teach mathematics, and what is the class size (number of pupils)?

|    | <u>STANDARD</u> |     | <u>CLASS SIZE</u> |
|----|-----------------|-----|-------------------|
| a) | 4 .....         | [ ] | .....             |
| b) | 5 .....         | [ ] | .....             |
| c) | 6 .....         | [ ] | .....             |
| d) | 7 .....         | [ ] | .....             |
| e) | 8 .....         | [ ] | .....             |

23 Is the time allocated enough for you to be able to assist each pupil during the lesson?

(a) Yes [ ]

(b) No [ ]

24 Rate the following methods as you usually use them in teaching mathematics.

|                                   | V. REGULARLY | REGULARLY | LESS<br>REGU-<br>LARLY | NOT<br>REGU-<br>LARLY |
|-----------------------------------|--------------|-----------|------------------------|-----------------------|
| a) Lecture method                 |              |           |                        |                       |
| b) Class discussion or group work |              |           |                        |                       |
| c) Discovery method               |              |           |                        |                       |
| d) Question/answer method         |              |           |                        |                       |

25 Which of the following factors greatly affect the choice of teaching method(s) that you use in teaching mathematics?

- (a) Teaching load [    ]
- (b) Class size [    ]
- (c) The content and scope of mathematics syllabus. [    ]
- (d) Class discipline [    ]

26 Which mathematics reference books do you use when teaching mathematics? (name them)

- (a) .....
- (b) .....
- (c) .....

27. Are these reference books provided by the school or they are personal property?

.....

28 Which mathematics textbooks do your pupils use?  
(Name them)

(a) .....

(b) .....

(c) .....

29 Are these books sufficient?

(a) Yes [ ]

(b) No [ ]

30 Is the language use in the class textbook simple for pupils to follow and understand?

(a) Yes [ ]

(b) No [ ]

(c) Somehow [ ]

## APPENDIX B

CHECKLIST FOR TEACHING AIDS

Please write the number of the items present in your Mathematic Department. The items are listed below.

| <u>ITEM</u>                                  | <u>NUMBER AVAILABLE</u> |
|--|-------------------------|
| (a) Abacus                                   | .....                   |
| (b) Model (cuboids)                          | .....                   |
| (c) Fraction charts                          | .....                   |
| (d) Geometical sets                          | .....                   |
| (e) Shape recognition Kit                    | .....                   |
| (f) Pattern blocks                           | .....                   |
| (g) Measuring cylinder<br>(capacity measure) | .....                   |
| (h) Weights                                  | .....                   |
| (i) Dice                                     | .....                   |
| (j) Clockface                                | .....                   |
| (k) Chalkboard                               | .....                   |
| (l) Chalkboard rulers                        | .....                   |
| (m) Chalkboard protractors                   | .....                   |
| (n) Chalkboard compasses                     | .....                   |