

**INVESTIGATION OF TEXTBOOKS
PREFERRED
BY PRIMARY SCHOOL SCIENCE
TEACHERS IN NAKURU DISTRICT**

BY

MWANGI SAMWEL MWANIKI

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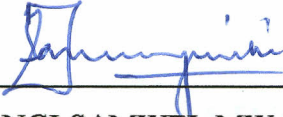


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DECLARATION

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



MWANGI SAMWEL MWANIKI

9/8/2000

DATE

This research project has been submitted with my approval as the university supervisor.



DR. DAVID W. KHATETE

9/8/2000

DATE

DEDICATION

DEDICATED TO

MY MOTHER, ESTHER,

MY WIFE ESTHER,

MY DAUGHTER ESTHER,

AND ALL OTHERS WHO

INSPIRED ME TO UNDERTAKE

THIS STUDY.

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ABSTRACT

A textbook is an essential aid in teaching and learning of science. Today, there are a large variety of science textbooks in the market in Kenya. From this large number of textbooks the Ministry of Education has selected a few and recommended them for use in primary schools. The classroom teachers are not consulted in regard to the best textbooks for use in their science classes.

This study was therefore intended to investigate the textbooks preferred by science teachers in primary schools. Specifically the study dealt with selection of textbooks, teachers' view of approved textbooks, textbooks preferred by science teachers and analysis of existing textbooks.

The sample was drawn from twenty-eight primary schools randomly selected in Nakuru district. The sample comprised of science teachers in upper primary. To solicit information from the subjects, a questionnaire was administered to the science teachers. A checklist was also sent to each school involved in the study.

The data collected was then analyzed. The result were presented as frequency and percentage distributions and tabulated appropriately.

The study revealed that teachers, through subject panels, usually sit down to discuss which science textbooks to buy. The main criteria used by the teachers in selecting textbooks is coverage of the syllabus, simplicity of language and good illustrations and diagrams. There are three main textbooks being used in upper primary schools, namely K.I.E series, Patel series and Singh series. Many teachers do not know the recommended textbooks. Eighty percent of the teachers however know that the K.I.E series is recommended. The recommended K.I.E series is very unpopular with science teachers. They view it as shallow, poor in content and time wasting, with too much discovery activities. Majority of teachers prefer to use either Patel series or Singh series. Those who use K.I.E series do so because they feel compelled by the ministry of education to use it. Teachers would prefer to have it removed from the list of recommended books. In general the textbooks

which science teachers prefer are different from those recommended by the ministry of education.

A few suggestions were made by the researcher, which are expected to counteract with some of the problems noted. The researcher felt that there is need for authors and publishers to enhance their methods of passing information to teachers about their new textbooks. There is also a need for involving all teachers in selecting textbooks for their classes. An attempt should also be made to improve communication from the ministry of education to teachers. The quality of textbooks especially quality of paper and binding, index glossary and bibliography should be improved.

Lastly an effort was made to identify other topics future scholars and researchers may consider venturing into.

CHAPTER ONE

1.1 BACKGROUND TO THE PROBLEM

Books are the tools of the teachers' trade. They come in all kinds, shapes and sizes. They provide the material from which the teacher can devise work for his class. They can supply a course of study for any child on any subject. Books give enjoyment, stimulate interest and satisfy the need for information. Where the right books are readily available, reading for interest or information can also be reading for enjoyment. Aids to teaching, such as the chalkboard, television graphics, tape recorders and so on, cannot be used without books to supplement and confirm the truths that are presented.

One of the objectives of education as has been stated by many scholars is not so much to instill knowledge into a child, as to show him how to find things out for himself. In other words to show him how to use books to teach him to discover the difficult art of choosing the right book for leisure reading and of picking out those which will most readily and readably give the answer to a question.

The time to make use of books is not just the library period or after school hours or during the break, it is in every class period, whether the subject is English, mathematics, science or history. Therefore as Kamm and Taylor(1968) put it "Every classroom becomes a school library and every teacher a school librarian"

If children are to be encouraged to use books, opportunities must be created for them to see plenty of attractive ones. They should feel that books are indispensable to a full appreciation of life. They should be able to find them easily, to handle them, to look at them, to read them and ultimately to study them.

Today we have many books in the market. It is often said even by publishers themselves, that there are too many. Too many books bring a problem of choice to both publishers and teachers. Among the many printed books available there are inevitably bad books as well as good ones. For one there are not enough really outstanding authors. Publishers are not fools; neither are they educational charities. They are primarily businessmen trying to provide at the most competitive price a product, which will suit their customers.

Considering that there are really good books in the market, there should not be any demand for poor quality books. However, the fact that poor quality books end up being purchased for school children. As long as there appears to be sale for poor quality books, they will continue to be published. Our children should however have the best books and there is no reason to be satisfied with any thing but that.

Textbooks on all subjects and for all levels are pouring into the market every year. Each one has an apparent justification for its existence. New publishers enter the field and bring in new books. The teachers' problem is to extract, from these many books, those which will suit most exactly his purpose and the needs and interests of the particular children whom he is teaching. Whether he is buying forty copies of a book for class use, or one copy for reference or library, he must spare time, patience and energy if the best decision is to be made.

This study attempted to investigate the criteria the primary school teachers use to select science textbooks, and consequently reveal the type of textbooks they prefer.

1.2 STATEMENT OF THE PROBLEM

In Kenya today, the Ministry of Education and Human Resource development has compiled a comprehensive list of approved textbooks. These are the books recommended for use in primary schools. The list included pupils' course books, teachers' guides and reference books such as dictionaries and atlases that are designed as support instructional materials for the various courses.

Schools are expected to select their textbooks for purchase from the approved list of textbooks. In a circular, the chief inspector of schools strongly advises the schools to select their books subjectively.

In this circular, it is assumed that those who select the textbooks use some criteria. This study wishes to identify these criteria. It is further assumed that the recommended books are the very best in the market, and the books are certainly

popular with the teachers. This study attempts also to test the validity of these assumptions.

A lot of research has been done on quality of textbooks. Many scholars have written a lot about qualities of a good textbook and criteria of selection of textbooks. Little research has however been carried out to know exactly what science teachers look for when selecting their textbooks. Little is known about the science textbooks they are currently using and the textbook they would prefer to use. It was the aim of this study therefore to investigate the textbooks preferred by primary school science teachers.

1.3 RESEARCH QUESTIONS

To carry out this research, the study addressed itself to the following questions:

- 1.1.1 Which science textbooks do teachers prefer to use in primary schools?
- 1.1.2 Which science textbooks are teachers actually using?
- 1.1.3 What criteria do primary school teachers use in their selection of science textbooks?
- 1.1.4 Is there harmony between textbooks preferred by science teachers and the textbooks recommended by the ministry of education?

1.4 RESEARCH OBJECTIVES

The main aim of this study was to investigate the textbooks preferred by primary school science teachers. In view of this, the following objectives were developed:

- 1.1.5 To find out which science textbooks are available in primary schools.
- 1.1.6 To identify the science textbooks which primary school teachers prefer to use.
- 1.1.7 To find out whether the preferred science textbooks are the ones actually being used, and if not, account for it.
- 1.1.8 To determine the criteria which science teachers use in their selection of textbooks.

- 1.1.9 To find out if there is harmony between science textbooks preferred by primary school teachers and science textbooks recommended by the ministry of education
- 1.1.10 To find out the teachers' views about quality of existing science textbooks.

1.5 SIGNIFICANCE OF THE STUDY

This study will be helpful to those concerned with recommending textbooks for use in primary schools. It hopes to draw their attention to the teachers' preferences in regard to selection and use of science textbooks. The ministry of education and the Kenya institute of education will therefore benefit by getting feedback from the science teachers. They will consequently be aware of the teachers' preferences and feelings towards science textbooks available.

The study will also be important to the textbook publishers and authors. They will be able to write and publish better books as a result of the feedback from the teachers. They will now be more aware of what teachers look for when selecting science textbooks for use in primary schools.

It will also be useful to head teachers', parents and all other stakeholders who are often involved in textbook selection and purchasing. They will benefit from the teachers' views in regard to the best type of science textbooks to buy.

The study is also expected to be of benefit to textbook sellers, distributors and stockists. They will get ideas on the types of science textbooks preferred by teachers in primary schools. As a result they will be able to look for and store the very best books available.

The primary school teachers teaching science will also benefit from this study. After their preferences and selection criteria are studied, they will be compared to those of recognized professionals. Useful suggestions will thereafter be made which will certainly be of great value to the teachers. The result of this study will

therefore help to improve the teachers' ability to select suitable science textbooks for use in primary school

1.6 SCOPE AND LIMITATIONS OF THE STUDY

This research was carried out in Nakuru district. Its findings cannot therefore be generalized to the entire Republic of Kenya. The researcher would have given a clearer picture of the study at hand if the research had involved more primary schools in the district.

Due to the geographical locations, this was not possible; the schools were too far apart. Also, due to the financial and time constraints the researcher was not able to deal with more schools and thus conduct an extensive research.

The study also did not involve all science teachers teaching in primary schools. It only involved those teachers teaching science. Further if there were more than four science teachers in a school, only four teachers, randomly selected, were involved in the study. In spite, of these limitations, the study gathered sufficient data which enabled the researcher to come up with reliable findings.

1.7 Assumptions

In conducting this study the researcher made the following assumptions:

- 1.1.11 That all the schools are adhering to a uniform syllabus.
- 1.1.12 That all the schools have information concerning recommended textbooks.
- 1.1.13 That all schools have at least one type of science textbook
- 1.1.14 That when any textbook is bought, there is a criteria used to select that particular book.
- 1.1.15 That the teachers in this research gave honest responses in the questionnaires

1.8 Definition Of Terms

Resources:

Any stimulant used in teaching and learning such as persons, facilities equipment and reading materials.

Textbook:

Books giving instructions in a branch of learning, particularly those books that are relevant to a learning program. They are usually tailored to meet needs of a particular course.

Criteria:

Standard or principal by which something is judged

Upper primary:

Classes between standard five and standard eight inclusive.

K.I.E

Kenya Institute of Education

K.I.E series:

Set of science textbooks for all classes in primary school entitled "primary science" The writer is KIE and is published by Kenya literature bureau.

Patel series:

Set of science textbooks for different classes in primary school entitled "science and agriculture". The authors are N.M. Patel and S.K. vasishta. The books are published by malimu publications.

Singh series:

Set of science textbooks for different classes in primary schools entitled "science workbook". The author is Malkiat Singh and the publisher is a Dhillon publisher.

Public School.

A primary school that is owned and run by the government of Kenya. All the teachers in such a school are employed by the Teachers' service commission. In contrast, a private school is owned and run by an individual, group of individuals or a private organization. In such a school, they employ their own teachers and may have a different curriculum.

CHAPTER TWO

LITERATURE REVIEW

2.1 DEFINITION OF TEXTBOOK

According to Harris and Hodge (1983) and Deighton (1971), a textbook is any book used as a guide to teaching and learning and which deals with a particular subject matter. Harris and Hodge (1983) go on to say that such books are used especially in schools and colleges while Deighton (1971) says that they can also be used for instructional purposes in churches.

The physical outlook though does not determine what is and what is not a textbook. This is because they come in varying formats including content. The textbook according to Deighton provides an orderly introduction to a discipline or subject area

Unwin and McAleese (1978) say that a textbook unlike a prose novel contains listed information, explanatory notes, diagrams, pictures and so on.

According to Kamm and Taylor (1968) the various changes in nature and functions of a textbook have made it almost impossible to determine what is and what is not a textbook. This is because some books, which were not designed as textbooks, are now being used as such. On the other hand, many books, which are intended to be textbooks, are outwardly indistinguishable from ordinary books, and they are occasionally sold to the general public.

2.2 IMPORTANCE OF A TEXTBOOK

Many scholars have highlighted the importance of textbooks. Obanya (1983) feels that a textbook is the most commonly used tool for classroom teaching. He says that it can best be used as a learning facilitator.

According to Simeonov (1980) books play an important role in Bulgaria. Similarly Stelmakh (1982) says that books hold a very important position among the Soviets and no other mass media can actually compete with them.

According to the World Congress (1982) books are important vehicles for information, education, and research and also as sources of culture and recreation. Oakshott (1982) sees textbooks as the oldest means of communication. She contends that the book is often regarded as being almost sacred due to its beauties. She thinks that no new technology is likely to replace the books, which to her are greatly flexible, convenient and have great educational value. To her the book is and will remain the most effective and efficient medium of communication.

According to Kamm and Taylor (1968) the textbook is the most important tool for the teacher even at this age of audiovisual technology. They argue that books are indispensable to a full appreciation of life. Modjaben, one of the writers in the UNESCO publications book development in Africa (1969) sees the book as a very important tool for social and economic development of any country.

Dale (1969) sees the textbook as being the traditional instruction tool. He says that they are highly effective especially if they are creatively written and ably used. Kaggia (1987) sees the textbook as having an advantage over other resources since it is versatile, flexible, and convenient and has unquestionable impact on its readers. Mulupi (1991) says that textbooks are a store of knowledge and that a learner can without teacher's guidance retrieve this knowledge.

Tennenbaum and Stillman (1960) think that textbooks are very important. This is because they enable authors without coming into classroom to give information to both teachers and pupils. They believe that the most important tool for teaching science is a well-chosen textbook.

According to Massey (1965) the textbook is an assistant teacher in print. She says that the science textbook is a handy source of reference material. Hanson (1973) says that science textbooks present established knowledge and accepted views and do so authoritatively, systematically and fairly fully.

Dass (1963) says that the science textbook is a wonderful aid in teaching of science. This is because it enables pupils to get general knowledge of aspects of science, which the teacher may not deal with in the time at his disposal for class teaching. Locatis and Atkinson (1984) feel that textbooks are important because they can present large quantities of verbal information. They come in handy when a lot of material must be learned or used over a long period of time. They say that the books are useful because they provide both illustrations as well as accommodate learner responses.

2.3 UTILIZATION OF TEXTBOOKS

Both the teacher and the pupil in various ways can use the textbook. Some ways of using textbooks seem to be more acceptable than others as will be evident in the following works.

According to Dale (1969) it is wrong for a teacher to see a textbook as being able to deliver all the required content of the course. He says that a single set of textbooks should never be used in a class since it will not meet the needs of all the students. This is because a normal class consists of students having a wide range of abilities.

Kamm and Taylor (1968) suggest the textbook can be utilized by the students for reading while the teacher can use it for lesson preparation. can utilize the textbook. Massey (1965) says that students must learn to hunt up information in specialized reference books but much organized data from a variety of sources should be found in the class textbook. He goes on to say that textbooks can actually teach—they are a second means of teaching. He says that a textbook can be a real boon if a pupil has been away from school or if he has difficulty in understanding science lessons. He further says that teachers should be reading casually paragraphs from great writing in science. According to him, pupils who hear their teachers read passages from good books are likely to read more and more books themselves.

Hanson (1973) says that science textbooks should be used for reading and study rather than for quick consultation. Dass (1963) says that a science textbook can be

used as an aid to teaching science. Locatis and Atkinson (1984) say that science textbooks can be used for individualized instructions, giving homework and self-examination.

In this literature review some methods of textbook utilization have been highlighted. In summary, a textbook can be used:

- As reference material
- As students' homework book
- For reading round the class
- As a separate set of class book for group work
- For information about experiments
- For reading a head by both students and teachers
- By students for consultation
- For provision of exercises to be done in school and at home
- For reading assignments
- For note making
- For diagram construction
- For individualized learning activities
- As a guide to experiments and report writing

2.4 ADVANTAGES AND DISADVANTAGES OF TEXTBOOKS

According to Dale (1969) the reception of knowledge through a textbook is very cheap since no sophisticated machines are necessary for its acquisition. Unlike the radio and television a teacher is able to read and stop when he feels like and then continue or even repeat what he has read as he deems necessary. The information obtained from a textbook is also accurate and permanent. The use of the textbook is also very convenient since the user can underline important sections for future reference. The understanding of lengthy content is also made far much easier through the use of pictures, the scene being described is made more concrete and real thus a better understanding is attained. The textbook allows a pupil to proceed at his own pace. By providing generalizations, the learner is able to continue with

further reading. The review and reorganization of the knowledge received is also made possible.

Heinich et al (1989) says that textbooks have many attributes, which make them superior to other media of instruction. For example they have the greatest amount of information presented in the least amount of time.

Brown (1973) says that textbooks offer excellent visualization of concepts and are quite informal with the accompanying verbal content. Some are published in interestingly varied forms, which are attractive, colorful and are well illustrated.

Heathorn (1977) says that a textbook is a condensation of a long program of instruction. It is flexible and may be read forwards, backwards, skimmed and even skipped in certain sections. He says that a textbook can be read anywhere such as at fire place, on a bus while sitting, standing and so on. Thus a textbook is user controlled, and greatly facilitates, individualization of instruction.

Massey (1965) says that textbooks also have disadvantages. Some books have various biases while others are specifically geared towards examinations. Another disadvantage of books is that they cannot offer all experiences through writing. In such cases the reader may end up getting one-sided view of whatever is sited.

According to Dale (1964) some of the weakness of books are based on the fact that they encourage memorization and in some cases deliver too much information at the same time. To him most textbooks have the undesirable habit of giving answers to questions not addressed to by the learners. Since it is very difficult to keep a textbook up to date, new books have to be acquired every now and then. Some books are not self-instructing and so the teacher has to come in to provide necessary explanations each time and some books too, fail to motivate students enough.

The greatest weakness of the textbook according to Deighton (1971) is its generality of target audience since it is usually produced for wide market without any consideration of regional differences. Some limitations of textbooks according

to Dale (1973) are that they treat too many topics but never in depth, they are never always correct and single textbook used in a single grade rarely meet the varied abilities of a typical class. Further he says that textbooks can be misused: lazy and unprepared teachers tend to follow textbooks as if it were a lesson plan. This means that they rarely read beyond the textbook and thus add nothing new. There is also the bad tendency to use textbooks as the exclusive reading material for a whole year. This tendency leads to authoritarianism of the textbook.

Massey (1965) while talking about misuse of textbooks says that the teacher should not always echo the lessons of the textbook; or else he may become merely a “textbook with a voice”.

2.5 PUBLISHING OF BOOKS IN KENYA

The publishing of primary school textbooks is well established in Kenya. This has been possible because of the vast domestic market. Chakava (1980) says,

“ The textbooks are of course the bread and butter of Kenya publishing. There is a ready market especially in primary schools.”

There are three broad categories of publishers in Kenya:

- a) parastatals
- b) multi-national
- c) Local or indigenous publishers.

Parastatals include Jomo Kenyatta foundation and Kenya literature bureau, which is the publishing wing of Kenya institute of education. Multinational publishers include Heinemann, Longmans, Evans and so on. Local publishers include Gideon were press Savanis LTD, Soma LTD, Acts press and so on.

The ministry of education as a matter of policy adopts all books published by the parastatals publishers. They argue that the parastatals must be given priority because they were created to produce materials, which could give direction to Kenyan educational goals. The government is convinced that the books authored and published by the parastatals are the most relevant. They are authored by the

panels at the Kenya institute of education composed of teachers, lecturers and educationists of vast experiences. Such books are said to best meet the goals and aspirations of the curriculum.

The ministry of education argues further that other publishers are driven more by profit and not the promotion of aspirations of the society. Again some are foreign owned and in the event of crisis, they can pull out leaving the educational system tumbling. The publishers have opposed this monopoly arguing that it eliminates competition, which is vital for quality textbooks. They advocate for free competition.

Due to shortages, lateness and at times in appropriateness of some texts teachers often resort to private publishers to get substitutes or supplements to what is available. At the same time a circular from the chief inspector of schools (1999) has listed some books by private publishers, alongside books published by parastatals, as recommended books. The teachers are then asked to choose their textbooks from the list of approved books. This demands that teachers have a reasonable knowledge on how to choose a good textbook. Such a choice need to be suitable to the pupils and the teachers.

2.6 SELECTION OF TEXTBOOKS

In regard to selection of textbooks, an important issue emerges namely; who is to select the books? As regards this issue many researchers have come up with suggestions and findings on who should do the selection. In Sunday Nation (1990) Mutua suggested that teachers should be allowed to select what books to use. On the other hand the then minister for education indicated that it is the duty of the ministry of education to inform parents what is good and what is bad, failure in doing so would mean failure on the part of the ministry. The education editor of the newspaper supported the minister. He said that the ministry ought to determine the right material for students. He said that a list of approved books is welcome since without it, parents would be confused as to what book to buy. He said that it is the role of the Kenya institute of education to vet the book to be used in schools. He goes on to say,

“On the other hand teachers being professionals have the right to choose the books they consider best for their students.”

He further explains how this has failed when he says, “unfortunately many teachers have failed in this respect. As a result they allow inspectors of schools to dictate to them what books to use.”

He ends up saying that the ministry should put into consideration the many books that can be used in teaching a given course and then allow schools to select any of them depending on the teachers’ preferences.

Kamm and Taylor (1968) say that the freedom of choice of textbook is a privilege, which should be jealously guarded. Without it a teacher can use only those books which are prescribed, and is therefore forced to follow a course of study devised by others for him to use. An imaginative approach is curbed.

Dass (1963) says that teachers should select their textbooks. The science books so chosen for primary schools should cover a wide range of topics and all areas of science. He says that it is not easy, even for experienced teachers to make a selection out of the multitude of books on science, which are now available.

Taggart (1980) says that teachers should be involved in selection of textbooks. To make this possible she says that new books for preview should be made available to teachers for possible selection. She says that students too should be involved in selection wherever possible. Criteria for selection of books should be formulated and used by all. She recommends the following activities in selection process:

- Involve teachers in previewing books.
- Maintain a file of reviews and review sources such as review periodicals
- Organize and plan for teachers to visit selection centers, bookshops and book distributors
- Maintain a file of commercial catalogues
- Periodically provide an exhibit of books; invite publishers and vendors to exhibit their books.
- Ask publishers for examination copies

In Kenya today, teachers in primary schools are allowed to select textbooks for use in the various subjects. They can however only select books from the official list of recommended books. The approved list of books includes textbooks, teachers' guides, reference books, atlases and readers. After the teachers have done the selection parents or donors provide the money for the purchase of books. This of course is an improvement from where a single textbook was recommended for use. Now the teachers can atleast choose from a number of books.

The ministry of education has taken a bold step to streamline the textbook selection for primary education syllabus. According to Daily Nation (2000) the plan if implemented will end the confusion that has surrounded the selection of textbooks for primary schools. The new system will involve all stakeholders unlike in the past where the ministry did the selection. The new process will also train education officers, parents and teachers on book selection. In the past, there have been allegations of collusion between some publishers and certain officials of Kenya institute of education in deciding on textbook to be used in schools. In the new plan books will be vetted by the Kenya institute of education after being selected by teachers, parents and ministry officials. According to the ministry the list of books will be reviewed after every two years to allow in new publishers and to check the relevance of existing texts. In the meantime, some schools have established school textbook selection committees (STSC).

Kamm and Taylor (1968) caution about use of recommended lists of textbooks. They say that recommended lists of textbooks are dangerous in that "recommended" can so easily come to mean, "prescribed" and any hint of prescription can ultimately deny the teacher his freedom to choose the books he wants to use. According to them any recommended list, of whatever kind of books must depend on the individual preferences or even personalities of its compilers, and any book that does not appear on it because it has not come to their notice, or has come to their notice too late, tends to be condemned through omission.

2.7 CRITERIA FOR SELECTING TEXTBOOKS

Saunders (1974) believes that any instructional material should be selected for its effectiveness and not simply the cost. What the teacher selects must be which will enable the given subject to be communicated in much easier way.

In outlining the criteria of a good textbook, sidhu (1982) feels that when choosing the textbook, the teacher should ascertain that topics are those that will attain the objectives of the course. It is also important that the book be in harmony with current curriculum emphasis and uses strategies that are based on sound learning principles. The content should be up to date and the topics structured in a clear and concise way.

Sidhu further argues that the language of a textbook should be analyzed before it is bought. The language used 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.

The book also needs to meet the psychological needs of the pupils. The material included should create interest and motivate learning as well as meet the needs of different levels of ability. The size of the book should be convenient for carrying and format of the pages attractive and inviting. The use of color and illustrations are a clue for this. Also arrangements, headings and typing should make the location of material convenient.

Kalijaiye (1985) recommends that textbooks should have a teacher's manual suggesting alternative teaching methods for a topic and if possible guidance on appropriate aids. Kirkman (1995) says that a good textbook should take into account both the accuracy and the propriety of the language chosen. Authors should consider the reader's familiarity of the subject, attitude towards the subject and his motivation.

Mount and Kovacs (1991) says that a good science textbook should be extensively illustrated and written with minimum scientific jargon. The language of the text

and information covered should depend on the target audience. The content should be up to date.

Kamm and Taylor (1968) say that badly designed book, badly produced book and one of poor literary quality should be rejected. They say that a well designed book is one that is pleasing to the eye and commends itself immediately to the reader by appropriate type face, good margins, space between lines, and nice illustrations. Good production means well-chosen paper, high standard of printing and suitable binding. In addition, they suggest that the following factors be considered when purchasing a textbook:

- The language and approach of the book
- Questions, exercises and suggestions for further study
- Answers to given questions
- Cost in relation to value and suitability
- Binding and size of the book
- Content: its depth, relevance and accuracy

In addition they say that the most difficult type of book of all for the teacher to assess is the science textbook. Good science textbook in primary school should teach less. Instead, it should make the pupils interested in the world around them, exciting them to think for themselves about what is going on, and encouraging them to find out how scientific principles are applied in everyday life. This according to them is the best way in which science can be learnt from non-scientists, with books designed for individual reading and reference.

Kamm and Taylor say that science textbooks for children should be:

- Accurate
- Of interest to the pupil throughout
- Clear
- Lucid
- Personal-encouraging the pupil to personally participate in the book and the world around him

In this literature review, the textbook has been defined. The importance, utilization, advantages and disadvantages of the textbook have been discussed in depth. Many scholars and researchers agree on the criteria to be used in selection of textbooks. The differences among these people are only on emphasis on different criteria. Many scholars agree that teachers should be involved in textbook selection and have given aids to assist in that process. No research has however been carried out to find out how teachers in Kenya today select their science textbooks. This study aims at finding out what criteria science teachers' use in selection of textbook.

Currently the ministry of education has produced a list of recommended textbooks. Teachers are required to choose their textbooks from this list. No research has been done to find out whether science teachers like and effectively use these recommended books. This study aims at getting the teachers feedback in regard to these recommended textbooks.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

The purpose of this research was to gather information on the textbooks preferred by primary school science teachers. This chapter will address itself to the following sections: description of sample, sampling procedures, instruments for collecting data, data collection procedures and data analysis.

3.2 Description of Sample

The sample used in this study was derived from population of the primary schools in Nakuru district. The research confined itself to public schools. There were four main reasons for choosing public schools. First, all public schools follow a uniform curriculum. Secondly the public schools have teachers who are similar in terms of their qualifications. Third, the parents of children in public schools are likely to be of similar economic background unlike their counterparts in private schools who are likely to be rich and can afford to buy any kind of textbook regardless of the cost. Finally, unlike private primary schools, the public schools occasionally receive similar aid in form of textbooks from the government and other donors. All these factors show that public schools are similar in terms of curriculum followed, quality and number of teachers as well as type and number of textbooks available.

The researcher was thus left with the 494 public primary schools in the District. These schools are spread all over the sixteen divisions including the Nakuru municipality. The sample included four science teachers in each school selected, one teacher for each class in the upper primary. The science teachers in upper primary were selected because it is in the upper primary where there are more science textbooks to choose from.

3.3 Sampling procedures

Out of the 494 government primary schools in Nakuru district twenty-eight were used in this study. These schools are more than five percent of the total number of schools in the district and they are well spread out in the whole district. This ensured that they were representative sample under the given constraints.

To get the sample, stratified random sampling was used. The primary schools were arranged into sixteen categories according to the division in which they are located. The sample was then obtained by randomly selecting five percent of the schools in each division. We therefore ended up having the schools selected for the study as shown below in the table 3.1 below:

Division	Number of schools	Number of schools selected
Karuri	28	1
Kuresoi	28	1
Ekeri	28	1
Chogoria	28	1
Malindi	28	1
...
Total	494	28

To ensure the representativeness of the study sample, all the names of the schools in each division were written on separate papers. The names of papers were placed in a hat, they were thoroughly mixed and then the required number of schools was selected at random.

For each of the schools that were selected for the study, the files are searched for the following details: first name, gender and class. Where there were more than one child belonging to a given first name, a child was selected at random. Only female were selected as male were not included. It was selected for

Table 3.1 Schools Selected for Study.

DIVISION	TOTAL NUMBER OF SCHOOLS	NUMBER OF SCHOOLS SELECTED
Naivasha	54	3
Gilgil	50	3
Bahati	52	3
Mbogoini	34	2
Rongai	45	2
Maunarak	15	1
Municipality	16	1
Lare	16	1
Njoro	28	1
Elburgon	20	1
Molo	16	1
Kamara	13	1
Kuresoi	34	2
Keringet	57	3
Olenguruone	31	2
Mauche	14	1
Total	494	28

To ensure the random nature of the desired sample, all the names of the schools in each division were written on pieces of paper. The pieces of paper were placed in a hat, they were thoroughly mixed and then the required number of schools was selected at random.

For each school selected four teachers were involved in this study. The four are science teachers teaching standard five, six, seven and eight. Where there were more than one teacher teaching at a given level, one teacher was selected at random, in case a teacher was teaching at more than one level, he was selected for

one only. There were cases therefore where only three or two teachers in a school were involved in the study.

3.4 Research Instruments

The desired information was gathered by use of a questionnaire and an observation guide. The questionnaire was prepared for the upper primary science teachers. This was chosen because it can collect information from many respondents within a limited time. The questionnaire consisted of both open and closed ended questions. These gave the researcher comprehensive data on a wide range of issues related to textbooks.

There was an observation schedule to solicit supplementary information. This was helpful in determining which textbook was present or absent, as well as the quantity present. A checklist was used for observational purposes. The two instruments are attached in appendix A and B.

3.5 Piloting and Data Collection Procedure

A pilot study was carried out in three schools to test the instruments listed above. Government primary schools not selected for the study were used for piloting because they have similar characteristics with the schools selected for this study. These pilot schools were randomly selected from schools not involved in the study.

When the pilot study was complete, necessary changes were made on the research instruments before proceeding for the research. The researcher through the head teacher of each institution gave out the questionnaires himself to the respondents. He then collected the filled questionnaires on an agreed later date.

3.6 Data Analysis

The information gathered was analyzed by use of both qualitative and quantitative description. The researcher used tables, percentages and frequency distribution in reporting the data.

The overall attitude score for each item in chapter one was in Section B of the teacher's questionnaires was reported as an overall attitude score. This was obtained by analysis of the attitudinal scale. A frequency distribution table was compiled to display the total responses of the teachers for each item. These totals were then assigned values using the likert method as follows: VG=5, G = 4, A = 3, P = 2 and VP = 1. The scores for each item were then computed as well as the overall score for each textbook

4.3 General Information

4.3.1 Teachers' Gender

The members of the study were divided into the gender of differences among the schools. The data involved in the study is as follows: The table below shows the gender of the teachers.

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

The main objective of this study as previously stated in chapter one was to investigate the criteria used by primary school teachers in their selection and use of science textbooks.

To gather this information the researcher used two instruments namely:

- (a) teachers' questionnaire
- (b) A checklist.

This chapter therefore presents an analysis of the responses obtained from these two instruments. To display this information, the researcher has utilized tables which depict frequencies and percentages (wherever applicable) for these responses.

4.2 General Information

Since this study dealt with science teachers' some general information about them was sought. This included their gender; their teaching experience and the number of years they have taught science in particular.

4.2.1 Teachers' Gender

The intention of this item was to find out the gender differences among the science teachers involved in the study. The table below shows the gender of the teachers;

Table 4.1: The Teachers Gender

Gender	No. of teachers	Percentage
Male	47	54
Female	40	46
Total	87	100

As displayed by this table, 54% of the teachers in this study were male and 46% were female. This shows that both sexes are fairly represented.

4.2.2 Teaching experience

The intention of this item was to reveal the service duration of the teachers currently teaching science in upper primary school. A strong argument exists that the teaching skill of any subject is refined with years of service as one gets to know the effective teaching approaches and resource materials for various topics.

Table 4.2 :Teaching Experience

Teaching experience	No. of respondents	Percentage
Less than 1 years	0	0
2 – 4 years	9	10.3
5 – 6 years	3	3.4
7 – 9 years	6	6.9
10 years and over	69	79.3
Total	87	100

The majority of the teachers (79.3) have taught for duration of ten years and above. None of the teachers teaching science in upper primary has taught for less than one year. The researcher also wanted to find out the number of years these

teachers have taught science in particular. This data is displayed in the table below:

Table 4.3: Years of teaching science

Duration	No. of respondents	Percentage
Less than 1 year	0	0
2 – 4 years	12	13.7
5 – 6 years	17	19.5
7 – 9 years	17	19.5
10 years and above	41	47.2
Total	87	100

These results show that almost half of the teacher's (47.2%) have taught science for ten or more years. The teachers teaching science have considerable years of teaching this subject. The teachers were then asked to identify the classes they are currently teaching science.

Table 4.4: Classes Taught by Respondents

Classes	No. of respondents	Percentage
Std 5	21	24.1
Std 6	18	20.7
Std 7	24	27.6
Std 8	24	27.6
Total	87	100

The table shows that all the four classes were fairly represented in the study. It was however not possible to have equal number of teachers for every level.

4.3 Selection of textbooks

Today there are many textbooks available in the market. Ultimately a choice must be made in regard to which textbook will be used in the science class. The analysis below attempts to show the way textbooks are selected in schools.

4.3.1 Awareness of new textbooks

New textbooks are being published every year. This item sought to find out whether the science teachers get to know when new textbooks get into the market.

Table 4.5: Teachers' Awareness of New Textbooks

Response	No. of respondents	Percentage
Yes	34	39
No	53	61
Total	87	100

The table above shows that most of the teachers (61%) do not know when a new textbook is released.

The teachers were then asked to indicate the sources from which they get information about the new textbooks.

Table 4.6: Sources From Which Teachers Learn About New Books

Source	No. of respondents	percentage
Bookshops	20	23.0
Head teacher	12	13.8
Catalogues	32	36.8
Others	23	26.4
Total	87	100

The majority of teachers (73.6%) indicated that they learnt about new science textbooks from three sources namely bookshops, head teachers and catalogues.

4.3.2 Involvement in selection of textbooks

The intention of this item was to find out whether the teachers are involved in the selection of the science textbooks they use in class. First they were asked whether before buying textbooks teachers sit down to discuss which ones should be bought.

Table 4.6A: Showing Whether Teachers Discuss the Books to be Bought

Response	No. of respondents	Percentage
Yes	72	82.8
No	15	17.2
Total	87	100.0

Most of the teachers (82.8%) indicated that teachers sit down to discuss which science textbooks should be bought. The teachers selected for this study were then asked whether they were specifically involved in selection of science textbooks.

Table 4.6b: Teachers Involved in Selection of Textbooks

Response	No. of respondents	percentage
Yes	54	62.1
No	33	37.9
Total	87	100.0

The table above shows that 62.1% of the teachers in this study are directly involved in the selection of science textbooks.

4.3.3 Criteria used in selection of textbooks

This item sought to find out what science teachers look for when selecting a book to be used as a class text.

Table 4.7: Criteria Used in Selecting Textbooks

Criteria	No. of respondents	Percentage
Coverage of syllabus	31	57.4
Simplicity of language	11	20.4
Illustrations and diagrams	10	18.5
Others	2	3.7
Total	54	100

The teachers indicated that in selecting textbooks, they mainly look at its coverage of approved syllabus, simplicity of language and illustrations.

The teachers who are not involved in selecting textbooks were asked to indicate who selects the textbooks they use.

Table 4.8: Showing who Selects Textbooks

Selecting agent	No. of respondents	Percentage
K.I.E	5	15.2
Subject panels	5	15.2
Unknown	18	54.4
Others	5	15.2
Total	33	100.0

This table shows that more than half of the teachers who are not involved in textbook selection do not know who selects the textbooks for them.

The teachers who are not involved in selection of textbooks were asked what criteria they would use if they were to select the books themselves.

Table 4.9: Criteria to Use in Selection of Textbooks.

Criteria	No. of respondents	Percentage
Coverage of syllabus	17	51.5
Simplicity of language	10	30.3
illustrations	3	9.1
Relevance to examination	3	9.1
Total	33	100

The table depicts that about half of the teachers (51.5%) consider the coverage of the syllabus as the main criteria of selecting textbooks.

4.4.1 The science textbooks currently being used

The aim of this item was to find out the science textbooks being used in upper primary.

Table 4.10a: Textbooks Being Used

Textbook	No. of respondents	Percentage
Primary science by (K.I.E)	37	42.5
Learning science (by Patel)	26	29.9
Science workbook (by Singh)	16	18.4
Others	8	9.2
Total	87	100

The table shows that the majority of teachers (90.8%) use three textbooks namely primary science, learning science and science workbook. The checklist was also used to find out which recommended science textbooks are available in the schools.

Table 4.10b: Recommended Textbooks Available in Schools

Textbook	Number	Percentage
Primary science (KIE)	257	21.7
Science matters (EAEP)	25	2.1
Start finding out (Longhorn)	12	1.0
Beginning science(Macmillan)	10	0.8
Others	879	74.4
Total	1183	100.0

The table shows that the four recommended textbooks constitute of only 25.6% of the textbooks in the schools.

4.4.2 Textbook preferences

The aim of this item was to find out whether the teachers were satisfied with the textbook they are currently using. They were therefore asked to indicate whether given the chance they would prefer to use a different textbook.

Table 4.11a: Teachers who Would Prefer a Different Textbook.

Response	No. of respondents	Percentage
Yes	40	46
No	47	54
Total	87	100

From these results we observe that a reasonable number of teachers (46%) would prefer to use a different textbook.

The teachers who indicated that they would prefer a different textbook were then asked to state which book they would prefer to use.

Table 4.11b: Teachers Preferences of Textbooks

Textbook	No. of respondents	percentage
Science workbook(by Singh)	18	45
Learning science (by Patel)	14	35
Others	8	20
Total	40	100

The table shows that the teachers mainly prefer two textbooks namely science workbook by Malkiat Singh and Learning Science by Patel.

The teachers who have more than one textbook were asked whether their students preferred any one book.

Table 4.11c Pupils' Preferences of Textbooks

Textbook	No. of respondents	Percentage
Learning science (by Patel)	29	55.8
Science workbook (by Singh)	21	40.4
Others	2	3.8
Total	52	100

This table again shows that there are two major textbooks, which are preferred by students.

4.4.3 Why certain textbooks are preferred

The teachers were asked to state why they preferred certain books. The table below shows their responses.

Table 4.12a: Why Teachers Prefer Certain Textbooks

Reason	No. of respondents	Percentage
Good syllabus coverage	30	34.5
Simplicity of language	9	10.3
Illustrations, diagrams, and pictures	18	20.7
Revision questions and exercises	9	10.3
Others	21	24.2
Total	87	100

From this table we observe that good syllabus coverage tops in the list of reasons why teachers prefer certain books.

Table 4.12b: Why Pupils Prefer Certain Textbooks

Reasons	No. of respondents	Percentage
Easy to understand	23	42.2
Good illustrations	4	7.7
Enough content	9	17.3
Revision exercises and questions	7	13.5
Relevant to national examination	4	7.7
Others	5	9.6
Total	52	100

From this table we observe that 44.2% prefer certain textbooks because they are easy to understand.

4.4.4 Weakness of science textbooks

The teachers were asked to identify any weakness in the textbooks they are currently using. They gave varied weaknesses depending on the particular textbooks they are using. These include:

- Lack of details
- Failure to follow syllabus progressively
- Lack of adequate coverage of the syllabus
- Difficult language
- Not updated
- Expensive
- Difficult terms
- Printing errors
- Conflicting information
- Poor explanation
- Too many activities and practical work
- Shallow / little content

- Lack of illustrations, diagram and color
- Poor organization of content
- High cost
- Lack of local examples
- Boring

It was noted that almost all teachers complained about the K.I.E series. They said that this textbook has too many activities and very little content. The book expects pupils to discover most of the things and yet there is no adequate time for this.

4.5 Recommended textbooks

Currently the ministry of education has prepared a list of recommended textbooks from which schools are to select their textbooks. It was necessary to compare the textbooks being used in schools and the textbooks recommended by the ministry of education.

4.5.1 Awareness of Recommended Books

This item sought to find out whether the science teachers are aware of the books recommended by the ministry of education for use in primary schools. When asked which are the recommended science textbooks they gave the following responses:

Table 4.13: Recommended Textbooks According To The Teachers

Textbook	No. of respondents	Percentage
Learning science (by Patel)	7	8.0
Primary science (by K.I.E)	71	81.6
Science workbook (by Singh)	5	5.7
Beginning science (by Berluti)	2	2.3
Others	2	2.3
Total	87	100

The majority of science teachers (81.6%) are aware that primary science by K.I.E is a recommended book. Only 2.3% are aware that beginning science by Berluti is a recommended book.

When the teachers were asked whether the recommended books were the best in the market they gave the following responses.

Table 4.14: Teacher's View of Recommended Books

Response	No. of respondents	Percentages
Yes	22	25.3
No	65	74.7
Total	87	100.0

An overwhelming majority (74.7%) felt that the recommended textbooks are not the best.

4.5.2 Complaints about recommended textbooks

The teachers who thought that the recommended books are not the best were asked to state their complaints against these books.

Table 4.15: Complaints Against Recommended Textbooks

Complaint	No. of respondents	percentage
Shallow / little content	44	67.7
Too many experiments / activities	12	18.5
Not exam oriented	6	9.2
Others	3	4.6
Total	65	100

This table shows that more than half of these teachers (67.7%) complained of recommended textbooks being shallow.

4.5.3 Textbooks that should be added to the recommended books

This item sought to find out the teacher's view in regard to good textbooks, which have been left out in the list of recommended books.

Table 4.16: Textbooks That Should be Added into the List of Recommended Books

Textbook	No. of respondents	percentage
Learning science (by Patel)	29	33.3
Science workbook (by Singh)	40	46.0
Others	18	20.7
Total	87	100.0

From this table two main textbooks emerge as being popular and worthy to be recommended books.

When asked why they thought these textbooks should be included in the list of recommended books the teachers gave various reasons.

Table 4.17: Why Particular Textbooks Should Also be Recommended

Reason	No. of respondents	Percentage
Good coverage of syllabus	37	42.5
Availability of pictures and illustrations	5	5.7
Content well organized	5	5.7
Balanced activities	5	5.7
Revision questions and exercises	9	13.3
Easy language	23	26.4
Others	3	3.4
Total	87	100

This table shows that 42.5% of the teachers indicated that the books should be recommended because of their good coverage of the approved syllabus.

4.5.4 Textbooks that should be removed from list of recommended books

The item was to show whether there was any recommended textbook, which the science teachers were unhappy with.

Table 4.18: Textbooks That Should be Removed From the List of Recommended Books

Textbook	No. of respondents	Percentage
Primary science (by K.I.E)	43	49.4
None	44	50.6
Total	87	100

These results show that 50.6% of the teachers did not feel the need of removing any textbook from the list of recommended books. All the others felt that the K.I.E series should be removed from the list.

When asked why they felt the need of removing this textbook from the list of recommended books, the teachers gave three reasons:

- (a) The book is shallow and lacks important details
- (b) The book has too many activities, experiments for which there is no time
- (c) The pupils cannot use the book on their own.

4.5.5 Textbooks which are not recommended yet they are used

This item was meant to find out whether the teachers use any science textbooks, which are not recommended by the ministry of education.

Table 4.19: Textbooks, Which are Used But are Not Recommended

Textbooks	No. of respondents	Percentage
Learning science (by Patel)	42	48.3
Science workbook (by Singh)	34	39.1
Others	11	12.6
Total	87	100.0

This table shows that there are two books, which are widely used by science teachers despite the fact that they are not recommended by the ministry of education.

4.6 Analysis of quality of the textbooks currently being used

The importance of a textbook in providing the subject content, acting as a basis for individual study and provision of self-test exercise cannot be over emphasized. Indeed textbooks more often than not dictate what is to be taught in a given subject. For a textbook to fulfil its intended role it must match the abilities of its readers and have adequate coverage of the laid down syllabus.

The teachers were therefore asked to indicate their view of the quality of the textbooks they are using. Seventeen qualities of a textbook were provided and the teachers were asked to rate their suitability on a five – point scale namely very good, good, average, poor and very poor.

Three textbooks were found to be mainly used by the teachers. Their responses on the qualities of these textbooks are shown in the appendix C, D and E. When computed, the teachers responses on the scale resulted in the scores shown below:

Table 4.20: Scores From Analysis of Quality of Textbooks in Use.

Textbook	Score
Learning science (by N.M. Patel)	3.6
Primary science (by KIE)	3.2
Science workbook (by. Singh)	3.9

The table depicts “primary science by K.I.E” as “average” while the other two as “good” . The following three tables show the specific qualities of the three textbooks.

11. Accuracy of given information	Good	Good	Good
12. Spaces between lines for easy reading	Good	Good	Good
13. Topics well explained	Good	Good	Good
16. Index, glossary and bibliography	Average	Good	Good
17. Summary at end of chapters	Average	Good	Good

The table shows that all the three textbooks were rated as “good” for accuracy of given information, spaces between lines for easy reading, topics well explained, index, glossary and bibliography, and summary at end of chapters. However, all the three textbooks were rated as “average” for the quality of index, glossary and bibliography, and summary at end of chapters.

Table 4.21: Qualities of the Commonly Used Textbooks

	Quality	Patel series	KIE series	Singh series
1.	Material related to environment of pupils	Good	average	Very Good
2.	Material at level of the pupils	Good	average	Good
3.	Provides opportunities for practical work	Average	average	Good
4.	Language level of text	Good	Good	Good
5.	Material covers approved syllabus	Good	Good	Good
6.	Features, diagrams, pictures, tables	Good	average	Good
7.	Provides question for revision	Good	average	Very Good
8.	Cost	Average	Poor	average
9.	Handy in terms of area and volume (size)	Good	Good	Good
10.	Availability in local bookshops	Very good	Good	Good
11.	Quality in terms of paper and binding	Average	average	average
12.	Proper arrangement of content	Good	Good	Very Good
13.	Accuracy of given information	Good	Good	Good
14.	Spaces between lines for easy reading	Good	Good	Very Good
15.	Topics well sequenced	Good	Good	Good
16.	Index, glossary and bibliography	Average	average	average
17.	Summary at end of chapters	Average	average	Good

The table shows that all the three books fall short in cost, quality of paper and binding, index glossary and bibliography. They all received high rating in coverage of syllabus, availability and accuracy of given information.

CHAPTER FIVE

Discussion of The Findings, Summary And Suggestions

5.1 INTRODUCTION

This chapter focuses on a discussion on the data analyzed in the last chapter. Included also is a summary of the findings, recommendations and suggestions of studies that future scholars might venture into relating to science textbooks.

5.2 Discussion of the findings

From the data analysis carried out in chapter four various issues immersed in relation to textbooks preferred by primary school science teachers. Among these are selection criteria of textbooks, the popular textbooks in use, and comparison of textbooks in use with recommended textbooks.

5.2.1 Science teachers

The teacher is an important person in teaching and learning of any subject. The teacher is indeed a major determinant on how effective and efficient the teaching of a given subject will be. He is deeply involved in selection of textbooks which will be used in his / her class. It was therefore necessary to establish the background of the teachers involved in this study.

(a) Gender differences

Although the subjects in this study were randomly selected, both sexes were well represented. Table 4.1 shows that 54% of the respondents were male and 46% were female. This also shows that teaching of science in primary schools is no longer men's field. The women are now well represented and this will particularly encourage girls to take science seriously. The almost equal representation of males and females in this study also ensures that the views given are not gender biased.

(b)Teaching experience

Teaching competence in any given subject is a product of training and experience. Through experience, teachers do evaluate the various methods of teaching a given topic as well as the most effective teaching resources.

Table 4.2 shows that 79.3% of the science teachers in primary schools have taught for duration of over ten years. Only 10.3% of the teachers have taught for two to four years, while non-has taught for less than two years. This is quite impressive because it shows that the teachers in upper primary have a lot of teaching experience. It is however clear that all the newly employed teachers are teaching in lower primary. While the upper primary can be said to require more attention, the lower classes should not be neglected. They too need experienced teachers and therefore there is need to strike a balance.

Table 4.3 again shows that majority of science teachers (66.7%) have taught science for seven years or more. None of the teachers have taught for less than two years. The two tables show that experienced science teachers are currently in charge of the upper primary classes. Because of their vast experience these teachers can make good choices of science textbooks. In their many years of teaching experience they have encountered different types of textbooks. They have used a variety of these books and they have seen the outcome of using each type. These teachers were therefore ideal for this study.

5.2.2 Selections of textbooks

For any school to have science textbooks, some kind of selection must have taken place, even before the textbooks were purchased. To find out more about selection of these books it was first of all necessary to find out whether the teachers are aware about new textbooks, which are pouring into the market every year. Table 4.5 show that 61% of the science teachers do not get to know when a new science textbook is released. Table 4.6 show that information about new textbooks reach science teachers through three main ways, namely, heads teachers, bookshops and catalogues. This is a challenge to authors and publishers. They should advertise

their books so those teachers can know about their existence in the market. They should even give free sample copies to schools immediately they are published. The head teachers should also pass on information to teachers about new books as soon as possible.

Table 4.6A show that the majority of teachers (82.8%) said that teachers usually sit down to discuss about the books to be bought. The study established that there are subject panels, which discuss and decide which textbooks will be bought for each subject. 62.1% of all the teachers in this study are directly involved in selection of science textbooks through these panels.

This study established that three main criteria are used in selecting science textbooks. These include coverage of the syllabus, simplicity of language of the text and illustrations and diagrams. Others include;

- Attractiveness of the book
- Relevance to science examination
- Fair price
- Availability in the market
- Students needs, interests and aspirations
- Good organization of content
- Recommendation by the ministry of education

Among teachers who are not at all involved in selection of textbooks, 54% do not know who select textbooks for them. These only receive textbooks without knowing who selected them for them. When asked what they thought was the criteria used to select textbooks, these teachers gave four main ones; coverage of the syllabus, simplicity of language, illustrations and relevance to national examination. Though not involved in the selection, these teachers gave similar criteria as the previous groups of teachers.

These results show that coverage of the syllabus and simplicity of language carries a lot of weight among teachers. This is a challenge to authors and publishers of textbooks. Teachers are quoting these as their main indicators of good textbooks.

5.2.3 Textbooks currently being used

This study found out that there are three main textbooks being used by science teachers in upper primary. These are primary science (by K.I.E) learning science (by Patel) and science workbook (by Singh). These three constitute 90.8% of the textbooks being used as shown in table 4.10A. This was further confirmed by the checklist, which showed that the four recommended textbooks constitute of only 25.6% of the textbooks available in the schools.

When the teachers were asked whether they would prefer to use different textbooks from what they are currently using, a reasonable number (40%) responded in the affirmative. Out of these teachers, 80% indicated that they would prefer to use either science workbook (by Singh) or learning science (by Patel). This shows that the teachers who are currently dissatisfied with their textbooks are the K.I.E series users, and they would prefer to switch to either Patel series or Singh series.

The pupils' preferences as shown on table 4.11C concurred with those of the teachers. 96.2% of the pupils prefer either Patel series or Singh series. Only a mere 3.8% showed preference of other books. These results depict a situation where three main textbooks are used in science classes. Out of the three, two are more popular namely Patel series and Singh series. The third, KIE series is quite used but not preferred. This is probably because it is recommended and teachers, together with the head teachers feel obliged to use them whether they like them or not.

Table 4.12A show that teachers prefer the two books mainly because of their good coverage of the syllabus. Other reasons include simplicity of language, illustrations, diagrams and pictures, together with revision questions and exercises. The pupils prefer the books mainly because they are easy to understand. They also cite good illustrations, enough content revision questions and relevance to national examination as added points. All these show that teachers and pupils are looking for textbooks, which has enough content, relevant to the syllabus and presented in a simple language.

5.2.4 Use of recommended textbooks

This study revealed that many teachers are not aware of the recommended textbooks. Table 4.13 shows that 81.6% of the teachers are aware that the KIE is recommended text. Only 2.3% are aware that “beginning science by Berluti” is also recommended text. None is aware that there are two more recommended texts for upper primary namely “science matters by Opiyo” and “start finding out by longhorn”. It is also important to note from the same table that 16% of the teachers named some textbooks, which are not in the recommended list.

These results are disappointing because they show that teachers are not aware that they have four textbooks to choose from. They are not aware that we are no longer in the past situation where only one textbook was recommended for use in all schools. This shows that the circular in which recommended texts are listed never reached them. This is a challenge to improve the channel of communication between teachers and the ministry of education. Because of this ignorance, many teachers still keep on using KIE series not knowing that there are three other textbooks they are allowed to use.

Table 4.14 show that 74.7% of science teachers felt that the recommended textbooks are not the best for use in classes. Majority of them were of course referring to the KIE series which they think is the only recommended text. This text was mainly criticized for being shallow and dealing with too many activities / experiments. The teachers felt that the discovery approach in the KIE series is not good since the time they have is very little. Consequently they would prefer a text that presents facts in a well organized and packed manner. This is very discouraging because research has shown that science is best learnt by doing and discovering. The teachers however have a point in regard to the time allocated and the number of subjects the pupils are doing. This points a finger to our curriculum, which need revising with a view of looking into these issues. The teachers also need to change their attitude and accept KIE approach by doing their best within the time allocated.

When asked which textbook should be added into the list of recommended textbooks, the teachers mainly gave two textbooks. These are Patel series and Singh series. Only 20.7% of the teachers named other texts as worthy of inclusion in the list. Many reasons for the inclusion of these texts were given, the main one being good coverage of the syllabus, followed by simplicity of language.

Table 4.18 shows that almost half of the teachers (49.4%) felt that the KIE series should be removed from the list of recommended textbooks. This shows that the book is quite unpopular with the teachers. The teachers who are using it are probably doing that because they feel that they have no alternative. This number of teachers who are against the use of this text is significant. It therefore calls for a revision of this book with a view of improving it. The revision should take into account the criticisms of the teachers, the chief among them being too many activities and too little content.

The study showed that two main textbooks are used in public schools although the teachers are aware that they are not recommended. These are Patel series and Singh series. A few other textbooks are used although they are not recommended. The government should take note of this and probably find out why many science teachers insist on using textbooks which are not recommended. Teachers' choice of textbook should be respected because they are the ones on the ground. As noted earlier, majority of these teachers have many years of teaching experience. They therefore have first hand experience of what kind of textbooks are effective with their pupils. The government should therefore include these two sets of textbooks in the recommended list, or else produce a better text that will be acceptable to the science teachers.

5.2.5 Analysis of textbooks in use.

The three mainly used textbooks were thoroughly analyzed with a view of finding out their strength and weakness. The teachers were asked to rate these textbooks they use on a five-point scale, namely very good, good, average, poor and very

poor. The analysis was meant to show the teachers' view of the textbooks currently in the market.

Table 4.20 show that both Patel series and Singh series were rated as "good" while the KIE series was rated as average. The Patel series was found to have many good qualities the chief among them being good coverage of the syllabus, availability in local bookshops and simplicity of language. Its weaknesses include poor quality of paper and binding, lack of opportunities for practical work and lack of index, glossary and bibliography.

"Primary science by KIE" series was found to be good in arrangement of content, accuracy of given information, enough spaces between lines for easy reading and availability in local bookshops. Its weakness include poor or no summary at the end of chapters, too much practical work and material not matched with level of the pupils.

"Science workbook by Singh" was found to be good in provision of questions for revision, proper arrangement of content, spaces between lines for easy reading and material related to the environment of the pupils. Its weaknesses include cost, quality of paper and binding, together with index, glossary and bibliography.

It is noted with appreciation that the three books are well rated in all the seventeen qualities. The teachers however seem to express their concern on cost, quality of paper and binding, together with lack of index, glossary and bibliography in all the three books. The books are otherwise rated as good except KIE series which was rated as average.

5.3 Summary of the findings

This study showed that, the number of male and female science teachers are almost equal in upper primary. The majority of these teachers have teaching experience of over ten years. About half of the teachers do not get to know when new science textbooks are released into the market. Information, about new books reach them through catalogues, bookshops and head teachers.

Teachers, through subject panels usually sit down to discuss which science textbooks to buy. Three main criteria are used in selection of textbooks: coverage of the syllabus, simplicity of language and illustrations and diagrams. There are some teachers who are not involved at all in selection of textbooks. Some of these do not know who selects textbooks or what criterion is used to select the books.

There are three main textbooks being used by the science teachers. These are KIE series, Patel series and Singh series. Among these, KIE series is the least popular. Teachers who use KIE series seem to do so because they feel compelled to use it as a recommended text. These teachers expressed a preference for either Patel series or Singh series. The two books are preferred for their simplicity of language, coverage of the syllabus and illustrations. The pupils also prefer these two books because they are easy to understand.

The study revealed that many teachers are not aware of the recommended textbooks. Whereas 80% are able to identify KIE series as recommended text, they do not know that there are other three texts recommended for use in schools. There are also teachers who think that Patel series and Singh series are recommended, when in fact they are not. Over 70% of the teachers feel that the recommended KIE series is not suitable for use on science textbook. They criticized it for being shallow in content, and for using discovery approach. They claimed that the current system of education does not provide time for the many activities and experiments in the KIE series. The teachers recommended for the patel series and singh series to be included in the list of recommended textbooks. About half of the teachers recommended for the KIE series to be removed from the list of recommended textbooks. When analyzed all the three main textbooks were found to have both strengths and weakness. All were however found to be poor in cost, quality of paper and binding, as well as lack of index, glossary and bibliography.

In general it was found out the textbooks which teachers prefer to use are very different from those recommended by the ministry of education. It was however revealed that some teachers use recommended text, especially KIE series, although

they would prefer a different book. These teachers do so because they feel compelled by the government to use this text against their wish.

5.4 Recommendations of the study

In view of the various issues that emerged from this study relating to textbooks, the researcher wishes to make the following recommendations:

1. Experienced teachers should be well distributed in the various levels of primary school. This study shows that the experienced teachers are in upper primary school while all newly employed teachers must be in lower primary. All the levels require the services of experienced teachers and so they should be fairly distributed.
2. Authors and publishers should enhance their advertising of new textbooks. They should do this to ensure that information about new books reaches the teachers as early as possible. They should also be giving free sample copies to schools for creating awareness of their quality of books.
3. All teachers should be involved in selection of textbooks. This study showed that there are teachers who do not know who selects the textbooks or how they are selected. Where subject panels are used to select textbooks, teachers not in the panel should be allowed to submit their views for consideration.
4. Communication from the ministry of education to teachers should be improved. This study revealed that the majority of teachers do not know that there are four textbooks, which are recommended for use in upper primary. If possible more channels of communication should be used to ensure that information reaches all the teachers.
5. Teachers should be consulted before lists of recommended textbooks are issued. This study showed that teachers prefer different textbooks from those recommended and they have reasons for this. The government should consider allowing teachers to choose their own textbooks because they are professionals. In any case, the study showed that there are already many teachers who are not using the recommended books.

6. Authors and publishers should improve their books on paper and binding, cost, index, glossary and bibliography. This study showed that the textbooks in the market fall short in these qualities.

5.5 Suggestions for further research

1. Since this research was only carried out in Nakuru district and was only based in one subject, more research should be carried out in other districts and other subjects. It should also be carried out in lower primary and even in secondary schools.
2. Since this study concentrated on textbooks, other research should be carried out on utilization and selection of other teaching resources.
3. This study has shown that teachers prefer textbooks different from the ones recommended by the ministry of education. A research should be carried out to determine which of these two sets of textbooks is more effective

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APPENDICES

APPENDIX A: QUESTIONNAIRE FOR SCIENCE TEACHERS IN UPPER PRIMARY

Dear teacher,

This research questionnaire is part of a requirement for post-graduate studies in education. Its purpose is to gather information on the quality and selection of science textbooks used in upper primary school. You are invited to contribute to this study by responding to all the items in the questionnaire as honestly as you can. There is no need to write your name. All your responses will be held in confidence and will be used for statistical purposes only. Your sincere cooperation and open response is highly appreciated.

Sincerely yours,

Mwangi S. Mwaniki
Kenyatta University

SECTION A.

Write your responses in the spaces provided. Where alternative answers by inserting a tick (✓) in the brackets.

1. (a) your sex; male () female ()
 - (c) Your teaching experience; Years
 - (d) For how long have you taught science ?.....years
 - (e) Which class are you currently teaching science? Std
- for each of the questions below, give your answers in reference to this class. If

you are teaching more than one class, refer to one specific class and ignore the others.

2. (a) Do you know when a new science textbook is released? Yes () No (). If yes, from what source do you learn this?

- (f) Are you involved in selection of science textbooks to be used in your class? Yes () No (). If yes what criteria do you use to select science textbooks for your class?

If no, who selects the textbooks?

What criteria would you use if you were asked to select the science textbook?

3. (a) Which science textbook are you currently using in your class?

- (b) Given the chance would you prefer to use a different textbook? Yes () No ()
If yes, which textbook would you prefer?

Give a reason for your answer.

(g) What is it that you do not like in the textbook you are currently using?

4. (a) What are the recommended textbooks by the ministry of education for your class?

(b) In your view are the recommended books the most suitable for use in schools?
Yes () No (). If your answer is no give reasons.

(c) If you were given a chance, which book (s) would you add to the recommended book (s)?

Give reason (s) for your answer.

(d) If you were given a chance which book (s) would you remove from the recommended book (s)?

Give reason (s) for your answer.

5.(a) Before buying textbooks do teachers sit down to discuss which ones should be bought? Yes () No ()

(b) If you have several science textbooks, do your students tend to prefer any given one? Yes () No (). If yes which one?

Why do they prefer this one?

list the science books you use but are not recommended by the ministry of education

SECTION B

What is the name of the science textbook you are currently using?

Author (s)

To each of the following qualities listed indicate how appropriate the book is by circling one of the following responses;

VG- very good G – good A – average P – poor VP – very poor

Material related to environmental of the pupils	VG	G	A	P	VP
Material at level of the pupils	VG	G	A	P	VP
Provides opportunity for practical work	VG	G	A	P	VP
Language level of text	VG	G	A	P	VP
Material covers approved syllabus	VG	G	A	P	VP
Features, diagrams, pictures, tables	VG	G	A	P	VP
Provides questions for revision	VG	G	A	P	VP
Cost	VG	G	A	P	VP
Handy in terms of area and volume (size)	VG	G	A	P	VP
Availability in local bookshops	VG	G	A	P	VP
Quality in terms of paper and binding	VG	G	A	P	VP
Proper arrangement of content	VG	G	A	P	VP
Accuracy of given information	VG	G	A	P	VP
Spaces between lines for easy reading	VG	G	A	P	VP
Topics well sequenced	VG	G	A	P	VP
Index, glossary and bibliography	VG	G	A	P	VP
Summary at the end of chapters	VG	G	A	P	VP

APPENDIX B: CHECKLIST ON SCIENCE TEXTBOOKS
AVAILABLE IN UPPER PRIMARY

TEXTBOOK	NUMBER OF COPIES AVAILABLE IN THE SCHOOL				
	STD 5	STD 6	STD 7	STD 8	TOTAL
Primary science, Author; K.I.E. publisher Kenya literature bureau					
Science matters, Author; Opiyo and Ojwang, Publisher; E.A. educational publishers					
Start finding out, Author; different authors, publisher; Long-horn Kenya Ltd.					
Beginning science, Author; A. Berluti. Publisher; Macmillan publisher ltd					
Other books					
Total					

$$5(66) + 4(194) + 3(112) + 2(60) + 1(19) = 10$$

APPENDIX C: The frequency distribution of teachers responses;
analysis of quality of Patel Series

Item No	VG	G	A	P	VP	Total	Score	Result
1	2	14	8	2	0	26	3.6	G
2	6	8	10	2	0	26	3.7	G
3	2	6	8	10	0	26	3.0	A
4	2	12	12	0	0	26	3.6	G
5	10	10	6	0	0	26	4.2	G
6	6	12	6	2	0	26	3.8	G
7	6	10	4	6	0	26	3.6	G
8	0	12	10	4	0	26	3.3	A
9	4	18	2	2	0	26	3.9	G
10	14	10	2	0	0	26	4.5	VG
11	4	8	8	4	2	26	3.3	A
12	2	14	6	4	0	26	3.5	G
13	2	20	4	0	0	26	3.9	G
14	6	10	6	4	0	26	3.7	G
15	0	18	8	0	0	26	3.7	G
16	0	4	10	6	6	26	2.5	A
17	0	8	2	14	2	26	2.8	A
Total	66	194	112	60	10	442		

$$\text{Overall score} = \frac{5(66) + 4(194) + 3(112) + 2(60) + 1(10)}{442} = 3.6$$

APPENDIX D: The frequency distribution of the teachers responses; analysis of quality of K.I.E. Series

Item No	VG	G	A	P	VP	Total	Score	Result
1	2	18	11	4	2	37	3.4	A
2	0	4	27	4	2	37	2.9	A
3	4	11	4	7	11	37	2.7	A
4	3	19	15	0	0	37	3.7	G
5	11	9	7	10	0	37	3.7	G
6	7	9	11	10	0	37	3.4	A
7	3	19	7	4	4	37	3.4	A
8	4	0	6	21	6	37	2.3	P
9	4	22	11	0	0	37	3.8	G
10	14	19	4	0	0	37	4.3	G
11	0	19	7	7	4	37	3.1	A
12	7	22	7	1	0	37	3.9	G
13	4	26	7	0	0	37	3.9	G
14	7	22	7	1	0	37	3.9	G
15	4	26	7	0	0	37	3.9	G
16	4	15	11	0	7	37	3.2	A
17	0	11	11	7	8	37	2.7	A
Total	78	271	160	76	44	629		

$$\text{Overall score} = \frac{5(78) + 4(271) + 3(160) + 2(76) + 1(144)}{629} = 3.2$$

APPENDIX E: The frequency distribution of teachers' responses;
Analysis of quality of Singh Series

Item No	VG	G	A	P	VP	Total	Score	Result
1	8	8	0	0	0	16	4.5	VG
2	4	5	5	2	0	16	3.7	G
3	8	0	3	5	0	16	3.7	G
4	8	3	3	2	0	16	4.1	G
5	7	3	3	3	0	16	3.9	G
6	8	5	3	0	0	16	4.3	G
7	13	3	0	0	0	16	4.8	VG
8	0	3	8	5	0	16	2.9	A
9	3	9	3	1	0	16	3.9	G
10	5	8	3	0	0	16	4.1	G
11	0	5	5	3	3	16	2.8	A
12	8	8	0	0	0	16	4.5	VG
13	3	8	5	0	0	16	3.9	G
14	5	8	3	0	0	16	5.1	VG
15	9	5	1	1	0	16	4.4	G
16	0	5	5	1	5	16	2.6	A
17	5	8	3	0	0	16	4.1	G
Total	94	94	53	23	8	272		

$$\text{Overall score} = \frac{5(94) + 4(94) + 3(53) + 2(23) + 1(8)}{272} = 3.9$$