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READING COMPREHENSION AND IT'S RELATIONSHIP WITH ACADEMIC PERFORMANCE AMONG STANDARD EIGHT PUPILS IN RURAL MACHAKOS

BY

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Declaration

This thesis is my original work and has not been presented for a degree in any other university or any other award.

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I confirm that the work reported in this thesis was carried out under my supervision.

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Dedication

I dedicate this thesis to our daughter Gloria. May you grow in zeal for knowledge and excellence.

Acknowledgement

Several people have in various ways contributed to this thesis. I am very appreciative to my parents, Eliud and Janet Chege, whose great sacrifice and dedication to my education has been an encouragement and has made this work possible. Thank you, Mum and Dad. May God bless you abundantly.

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Abstract

The study investigates the relationship between pupils' reading comprehension and academic performance. It is common to attribute poor academic performance to lack of mastery of the particular subject skills. However, it is possible that this poor performance is due to poor reading comprehension ability. Local studies have recognised the importance of reading in academics. However, these have restricted themselves to pupils' ability to decode. Though decoding is important, the ultimate goal of all reading is comprehension. This study, therefore, sought to establish the relationship between reading comprehension and academic performance, and in so doing provide local empirical data that shows the magnitude of this relationship for various subjects offered in the primary school level.

In addition, the study investigated the relationship of pupils' reading comprehension with gender and intelligence. The study was carried out in Machakos District among Standard Eight pupils in five randomly selected primary schools. A reading comprehension test and a reasoning ability test were administered to the pupils. The results of the Machakos District end of year examinations were used as the measure of the pupils' academic performance in English, GHC, Kiswahili, Mathematics, and Science. The Pearson Product Moment Correlation was used to determine the relationship between the scores obtained in the reading comprehension test and the pupil's academic performance

for the various subject areas. Results indicated a positive correlation between reading comprehension and performance in all the five school subjects with English and Kiswahili recording the highest correlation co-efficient and Mathematics the lowest. To determine the relationship between intelligence and academic performance, the Pearson Product Moment Correlation was used. Results indicated a strong positive correlation between the two. In testing for the effect of gender on reading comprehension, a t-test of significance was used. There was no significant difference in the performance of boys and girls in reading comprehension. Further, the obtained correlation values between reading comprehension and academic performance were tested for gender differences. It was found that all the correlation values were higher for boys than for girls in all the subject areas except in GHC. In addition, the correlation values between reading comprehension and Mathematics and Science were not significant for the girls.

The study concluded that reading comprehension is related to academic performance for the subjects considered, and is therefore a factor to consider in seeking to elevate the academic performance of our pupils. A pupil's intelligence may be an indicator of his reading comprehension ability. However, data covering more detailed aspects of both reading comprehension and intelligence should be subjected to more powerful statistical testing to determine to what extent the pupils intelligence can be used to predict his reading comprehension ability. Girls performed better than boys in both Math and Science, subjects in which

traditionally boys perform better than girls. Further as earlier indicated, there was no correlation of this performance of girls in Mathematics and with reading comprehension. Further research would be necessary to establish the role of gender in reading comprehension and academic performance.

Table of Contents

CHAPTER THREE: METHODOLOGY

CHAPTER FOUR: DATA ANALYSIS

CHAPTER FIVE: CONCLUSION

List of Tables

List of Graphs and Figures

CHAPTER ONE

INTRODUCTION

1.1.0 Background to the Study

The aim of every education system the world over is to see that learning takes place among those being taught. To assess whether the objective of learning has been achieved, various methods are used. In the Kenyan education system, apart from internal school tests in the course of the term, pupils sit for written exams at the end of every year in order to graduate to the next class. There are also the final exams, that is, the Kenya Certificate of Primary Education, at the end of Standard Eight, and the Kenya Certificate of Secondary Education, at the end of Form Four, after which a student moves on to university education. These exams test a pupil's understanding of material taught over a period of time. It is therefore important that pupils be able to understand and respond to instructions given by their teachers, school texts and examination papers. This is clearly stated in the KCPE newsletter (1990) which declares that candidates who had poor mastery of English language could not hope to do well in the examinations because they would neither understand the questions nor be able to communicate their ideas adequately. Earlier, a study by the government of Kenya (1972) on curriculum development in the country, indicated that the national examinations given to students seemed to favour pupils who had well developed language skills. These

statements imply that in seeking to improve the academic performance in the schools, particular attention should be given to the language skills of the pupils and in particular, their reading comprehension skills.

In the Kenyan education system, English is the main language of teaching and testing. In the urban areas, right from standard one, pupils are instructed in the English language. However, in the rural areas, pupils are instructed in vernacular from standard one through to standard three, and in these years, English is taught as a subject, where the pupils are introduced to the basic language skills. These skills will be useful in later years where the pupils will receive written and oral instruction in English and will be required to communicate his responses in English. Regarding this, the Syllabus for Kenya primary schools (1986) states that at the end of the first three years, the child should have acquired a sufficient command of vocabulary and language patterns to enable him to use English as a medium of learning in the upper primary years.

In agreement with this is an assertion by Cleghorn, Merrit and Abagi (1989). They state that since English is the medium of instruction from standard four and the language of end of primary examination, it is an important target language to be mastered in the first few years of school.

The implication of these statements in the Syllabus for Kenya primary schools and by Cleghorn et al is that those pupils who have poorly developed reading skills in English may be unable to perform well in their academic work in both Arts and

Sciences. A study conducted by Fredricksen and Chitepo (1987) cited in Olaly (1991) shows some evidence of this. Their subjects were Swahili speaking students in coastal Kenya. In the study, they found that these students were able to give more inferential responses than literal responses to Science texts when the text was in Swahili as compared to when it was in English. This is attributed to the fact that they were highly proficient in Swahili, being the language of communication out of the classroom as well as the main language of instruction and communication within the classroom. Their proficiency in English was low and this adversely affected their performance in the Science test.

Some may argue that the poor performance in academic subjects is as a result of lack of mastery of the particular subject skills rather than the language of instruction. However, Dalton, Gliessman, Guthrie and Rees (1966) in their study demonstrated that pupils trained in reading comprehension skills over a period of time performed better in school examinations in comparison with those trained in study skills in the relevant subject areas over the same period of time. The cause of their poor performance could therefore be attributed more to lack of language skills other than lack of mastery of the subject area.

In the rural areas primary school pupils communicate mainly in vernacular at home. In the classroom, teaching is carried out in vernacular and the use of English in the classroom as the language of instruction begins in standard four. The education policy for the rural primary schools is that the language of the local

area in which the school is located should be the medium of instruction for the first three years of primary school. The pupils can use this same language to interact outside the classroom even in the higher primary grades. The model of bilingual education employed is the transitional bilingual education, as defined by Edwards (1980), cited in Samuda et al, (1984) where the plan is to phase out one language as the mainstream or majority language develops. However, generalising from the experience of the American Indians, Leap (1982), cited in Allen and Linn (1986), observed that the students who had been using the mother tongue at home and had to use English at school obtained a kind of English fluency which was not the fluency defined and expected in standard English. Their acquisition of English skills was greatly influenced by the language model they had at home from their parents who spoke 'Indian English'. This is likely to be the case in rural Kenya where the parents may not be fluent for example, in the use of correct tenses of verbs in English or able to fully express themselves in English. The rural child may thus be disadvantaged in his attainment of a sufficient command of vocabulary and knowledge of the syntactic and semantic structures of English by the time he is in standard eight and sitting his Kenya Certificate of Primary Education. This would in turn hinder his comprehension of English text in lessons and examinations since, for comprehension to take place, it is necessary for the pupil to have an understanding of words in the text, and develop comprehension of the meaning of the text or passage. The pupils should also be aware of grammatical rules to aid him in the reading of the text. In line with this, Mwangi

(1991) demonstrated in her research carried out in rural Kenya, that primary schools in which English was spoken exclusively in the school compound, performed better in English and Social Sciences than the schools in which pupils spoke in vernacular in the school compound. The implications from these studies is that the academic performance of the rural pupil may be hindered by his lack of mastery of English and in particular, reading comprehension skills. It could be that one of the causes of poor academic performance among rural pupils is poor or low reading comprehension ability.

1.2.0 Statement of The Problem

Reading is an important component in the classroom learning situation. The teacher seeks to equip the pupil with reading skills with the aim of aiding the pupil to independently interact with written material in a way that he correctly pronounces the words and understands the message contained in them. If a pupil is unable to extract meaning from words presented to him in print, then he is left unable to gain or learn from the written material. In both our primary and secondary schools much of the pupils' and students' learning depends on their ability to extract meaning from written material as a large part of the teaching-learning process takes place through the use of text books and teachers notes. In their adult life too, these pupils will encounter written instructions, media reports, announcements, and other written material which if read with understanding would serve to equip them to be well adjusted individuals capable of positively

impacting the society in their various areas of specialization. However, if the pupils do not learn to make sense of what they read, then they may encounter situations in their life after school where they are unable to interpret messages presented to them as was found by Kirigia (1991) in his study among primary school finalists

International research suggests that there is a positive relationship between reading comprehension and academic performance (Jayanthi and Vimala 1991, Linville 1970, Dalton et al 1966, and Martin 1963). However, local research has neither established the existence of such a relationship nor its magnitude. Some local studies have focused on the decoding abilities of pupils (Wario 1981, Gakunga 1980, and Kiugu 1977) and found performance of these to be on average of poor quality. Both Wario (1981) and Gakunga (1980) found a relationship between academic attainment and decoding ability of the pupils in their studies. It is important to establish whether this relationship exists with reading comprehension as well as this is the ultimate goal of the entire reading process.

In addition, intelligence and gender have through a series of studies emerged as significant variables that are related to ones' reading ability. Intelligence has in some instances been associated with ability to read (Lohnes and Gray, 1972). Studies by Stanovich, Cunningham and Dorothy (1980) and Andrew and Glossop (1978) cited in Stanovich et al (1980) indicate a positive relationship between intelligence and reading comprehension though the magnitude varied with the age

of the pupils. Gender differences have also been identified in studies by Heilman (1961) and Dale (1974), both of which favoured girls in reading comprehension abilities. It is necessary to identify whether intelligence and gender are also related to reading comprehension. A study establishing these relationships is particularly needed in the rural areas where it appears that education of girls is hampered due to social and cultural factors.

1.3.0 Purpose of the Study

This study therefore set out to establish if the pupils' reading comprehension relates to their academic performance in various school subjects. It further sought to determine how intelligence and gender relate to the reading comprehension ability of the pupil. Specifically, the study aimed at investigating the relationship between reading comprehension in English and academic performance, among standard eight pupils in the following school subjects:

1. English
2. Geography, History and Christian Religious Education (GHC)
3. Kiswahili
4. Mathematics
5. Science

The following are the questions that the research aimed to answer:

1. Is there any relationship between reading comprehension and academic achievement? If so, what is its magnitude for the various school subjects mentioned?

2. What is the strength and direction of the relationship between reading comprehension and intelligence?

3. Does gender relate to the level of pupils' reading comprehension?

1.4.0 Significance of the Study

It is apparent that reading comprehension is an important factor to be considered in the broad process of learning. How it relates to academic performance in our Kenyan education system is an issue that needs to be addressed to ensure that our pupils are well equipped for learning and that academic performance is enhanced.

The results of this study may be useful to various educational bodies and individuals. This study could shed some light on the relationship of reading comprehension with academic achievement. This will be useful to teachers and teacher trainers as it will help them consider the importance of teaching comprehension skills as they seek to improve their academic achievement.

The results can also be useful in developing methods of teaching reading in

schools, as they should indicate whether indeed reading comprehension is an aspect to be emphasised. In particular, those writing school texts including the Kenya Institute of Education should benefit from the results of this study, which should reflect the level of pupils' comprehension of text. This will act as a guide in the writing of school texts. It would also be useful as a guide in writing remedial texts for the poorer readers.

In setting school and national exams, consideration is given to the pupils' reading ability. The results of this study will be useful to those setting the exams, as they should reflect what relationship exists between reading comprehension and the various school subjects and thus guide the examiners as they consider factors contributing to the performance in the examinations. This would further help in preparing the students for the examinations, which is important as poor or good comprehension may in fact be a major determining factor in pupils' performance in examinations.

Overall, the study should pave way for further research in the broad area of reading and how it relates to academic achievement. Further research can be carried out on how reading comprehension takes place for various school subjects and other factors that influence the reading comprehension ability of the pupil.

1.5.0 Definition of Terms

Decoding:	Changing communication signals into messages. Used in reference to word identification rather than to higher units of learning.
Graphic information:	Information derived from the general shape of the word.
Semantic information:	Information derived from the relations between referents and names and between concepts and names.
Syntactic information:	Information derived from the pattern or structure of word order in sentences, clauses and phrases.
Reading comprehension:	The understanding of written language
Context:	The way a word is used in a sentence.
Reading:	Decoding written symbols into speech equivalents and acquiring meaning from the speech sounds.
Miscue:	An observed response in oral reading that deviates from the expected response in the text.

1.6.0 Limitations of the Study

This study considered reading comprehension as a whole. However, reading comprehension comprises of many levels and sub-levels, which could not have been considered in this study due to time and financial constraints. Also, due to time constraints, only two factors, intelligence and gender were studied as they relate to reading comprehension.

The study does not adopt one single model of reading but rather assumes that a reader uses reading processes that correspond to aspects of both the top-down and bottom-up models of reading. This is because the researcher has no control over the methods used in reading instruction that will influence a pupil's reading behaviours. It was outside the scope of this study to test the reading processes employed by the subjects or the models they correspond with.

CHAPTER TWO

LITERATURE REVIEW

The literature reviewed in this chapter concerns the main aspects of the study. These are theories of language acquisition, reading and reading comprehension, theories of reading, the relationship between reading comprehension and academic performance in various school subjects, and finally studies that have considered the role of and relationship between reading comprehension with intelligence and gender.

2.1.0 Theories of Language Acquisition

Reading is a process that involves many skills and sub-skills, and there are different theories regarding how reading actually takes place within the reader. Reading theories stem from broader theories of language acquisition which fall under two main categories:

Environmentalist theories: These stress the social and environmental factors that accompany language acquisition. They believe that the child observes and hears speech patterns of people around him, imitates them, and is reinforced. Skinner (1957) and Mowrer (1960), both cited in Goodwin and Klausimeier (1975) advanced this type of theory. Another psychologist, Lev Vygotsky (1978) cited in Gage and Berliner (1988), attributed a special role in cognitive

development to the social environment of the child. He noted that children begin learning from the people around them, their social world, which is the source of all their concepts, ideas, facts, skills and attitudes. This social world and one's culture determine which stimuli occur and are attended to. A criticism levelled against the environmentalist position by McNeill (1970) cited in Goodwin and Klausmeier (1975), is that this position cannot explain how young children speak sentences or phrases that they have never heard before. If imitation and reinforcement are the only processes operating, then the children would have needed to be exposed to these sentences and phrases before, so that they would imitate them, this imitation being more accurate as the child is reinforced.

Nativist theories: A learning theorist in this category also cited in Goodwin and Klausmeier (1975) is Chomsky (1972) He believes that innate, given structures are primarily responsible for language acquisition. Experience and imitation only take secondary importance. Chomsky postulates a pre-wired hypothetical Language Acquisition Device (LAD) that is activated at a given developmental age. This hypothetical structure sorts and processes the raw linguistic data heard by the child and generates for the child a set of more or less consistent grammatical rules. Chomsky states that this LAD would explain how most children learn to speak at the same age and with considerable structure and regularity to their speech, notwithstanding the large differences in primary linguistic data available to them through their parents and the environment. He states that "Grammar is represented in and is a 'real object' by which a persons' language can be defined".

Chomsky's views have not been without criticism. He was mainly concerned with the acquisition of a mentally represented rule system which enables one to become a fully competent language user, but he does not acknowledge that language is a human activity which, like all other human activities, influences and is influenced by social and political views. These environmental influences cannot be ignored, as observed by Hayley (1990). Moore and Carling (1982) also point out that Chomsky's view required that one exclude considerations of meaning and concentrate on Linguistic form. Futhermore, as observed by Goodwin and Klausmeier (1975), his position is dependent on primary linguistic data, and reinforcement and imitation certainly have a key role in the production of data of that sort. Moreover, Skinner and other experimental psychologists have been able to demonstrate by use of experiments that learning is enhanced where there are roles to imitate and some form of reinforcement.

It would be useful to consider acquisition of language as being a combination of both the nativist and the environmentalist theories. The child does seem to have innate capabilities that contribute to language development as suggested by Chomsky, accounting for the similarities in the acquisition of language by a child despite differing experiences and exposure. However, one cannot deny even from observation of the child that as he develops, imitation and reinforcement play a role in language development.

Reading then, being one of the components of language, can be said to develop

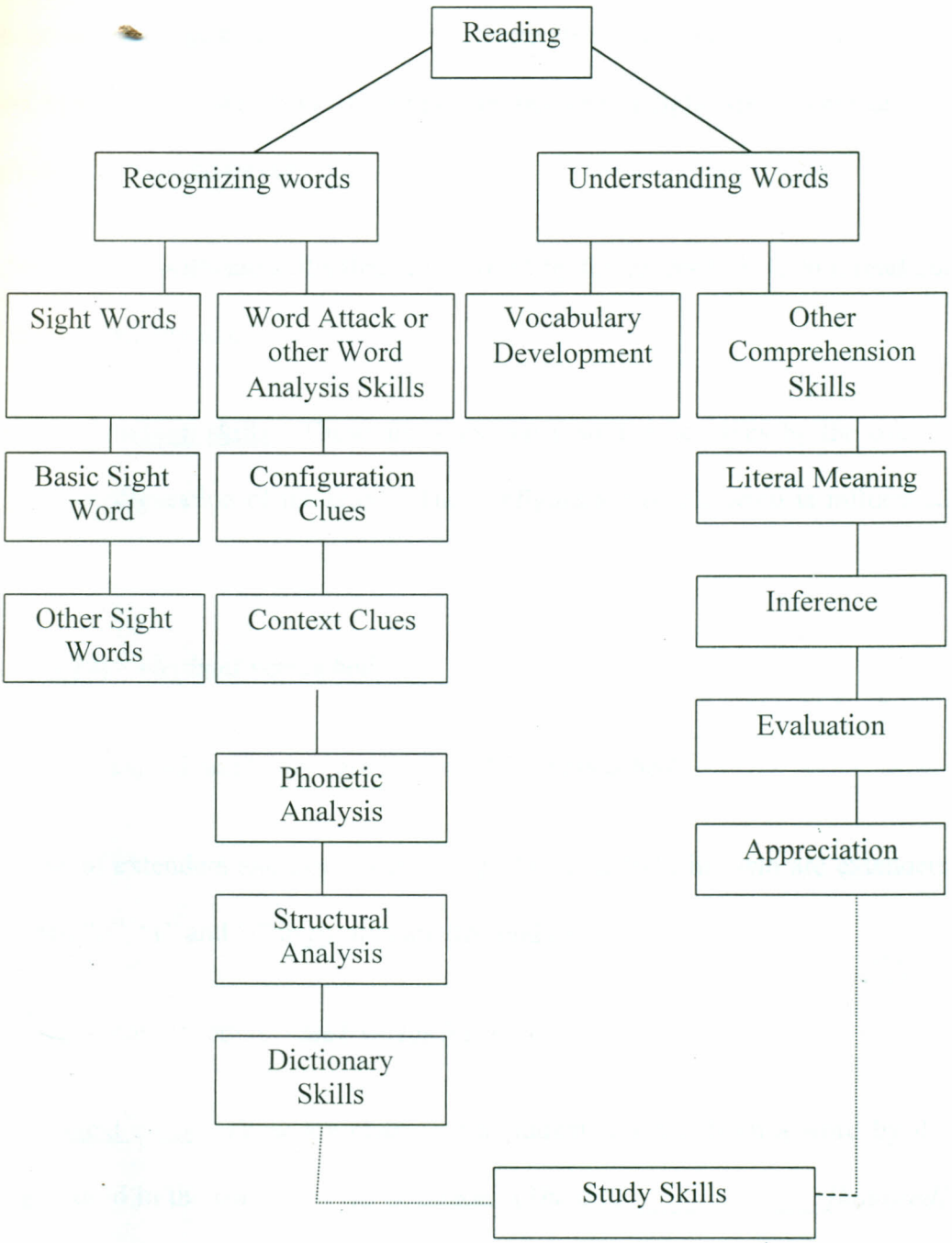
through the interplay of innate capabilities of the child and the environmental factors of models for imitation, and reinforcement.

2.1.1 Reading and Reading Comprehension

Reading is a process of recognizing words and understanding words and ideas (Ekwall, 1976). It is important to consider reading as both the ability to read words and the ability to understand their meaning and not focus on one aspect. It is possible to sound out words phonetically without understanding them just as it is possible to understand words without the ability to read them, but reading involves both aspects. Ekwall presented a model that clearly shows the various skills involved in the reading process. In this model he incorporates Barret's taxonomy of skills for comprehension to explain the processes involved in comprehension. The model is represented in Figure 2.1.

As can be seen from the model, reading involves recognising words and understanding words. Barret (1968) further divides word recognition into sight words and word attack or word analysis skills. Sight words comprise of:

1. Basic sight words: These are high utility words. They are words that appear most often on print. They are known as sight words as they are recognised immediately and do not require any application of word analysis or word attack skills. Such words include *a, and, are, he, but, one, you, who, where, when.*



(Source: Ekwall, 1976 Diagnosis and remediation of the disabled reader.)

Figure 2.1. Scope of reading skills

2. Other sight words: These include all words known instantly or known without the use of word attack skills. They are different from sight words in that at first a word may require word attack skills but soon becomes a sight word. They are not high utility words, however.

Word attack skills are skills that are invoked by the reader to help him read out the word. They involve:

1. Configuration skills: These are hints that a student receives by the overall shape or configuration of the word. The configuration of the word is influenced by:

- Length – *elephant* versus *bed*
- Use of capital and lower case letters – *BED* versus *bed*
- Use of extenders and descenders – e.g , "*l*," and "*b*" , in *lamb* are extenders and the "*p*", "*y*" and "*j*".in *pyjama* are descenders.
- Use of double letters – *look* versus *have*

2. Context clues: These are clues that a student receives from a word by the way it is used in the context of the sentence. (*The ball* _____*[bounced] up and down after the boy threw it across the room*).

3. Phonics: This refers to the sound-symbol relationships between the small,

usually non-meaning bearing parts of words e.g. sounds represented by consonants, consonant blends, vowels, vowel teams and special letter combinations.

4. Structural analysis: This is similar to phonics but refers to larger parts of words that bear meaning, such as root words, suffixes, prefixes, and word endings.

5. Dictionary skills: These apply to a number of attributes including alphabetizing of letters and words, locating a specific word, using guide words, and interpreting preferred spellings.

6. Study skills: Some of these are helpful in word analysis, for example, ability to find a word in an encyclopaedia and/or dictionary. A broken line is used to indicate that only part of the study skills would be considered as a sub-category of "word attack skills" and the relationship is not so direct as in the case of the other five sub-categories.

The other aspect of reading i.e. understanding words, involves both vocabulary development and other comprehension skills. Vocabulary development refers to the building up of the student's vocabulary, which comprises of words whose meaning the student knows and is able to use correctly in a sentence. The "other comprehension skills" will be presented as described by Thomas Barret (1968). They comprise of:

1. Literal meaning: This refers to the ideas and information explicitly stated in a

reading selection. The reader should be able to recognise and recall the words.

2. Inference: This occurs when a student uses the ideas and information explicitly stated in the selection, his intuition, and his personal experience as a basis for conjectures and hypotheses.

3. Evaluation: The student's response to text should indicate he has arrived at a judgement by comparing ideas presented in the selection with external criteria provided by the teacher, other authorities or written sources, or with internal criteria provided by the reader's experiences, knowledge, or values.

4. Appreciation: This calls for the student to be emotionally and aesthetically sensitive to the written work and to have a reaction to its psychological and artistic elements. For example, when a student verbalises his feelings about part or all of a reading selection in terms of excitement, fear, dislike, or boredom, he is functioning at the appreciation level.

This model therefore shows that reading is a process that consists of both recognising and understanding words with various sub-processes involved in each of these, each sub-process building upon the former one. Gardener (1978), while agreeing with the analysis of the reading process as presented by Barret, points out the important interaction between the reader and the text and suggests that Barret's categories might be reformulated in a manner that emphasises the reader directed nature of reading comprehension. This approach emphasises the mental processes

that occur as one moves from one level to another. They are:

1. Cognitive recall (i.e., the writer is saying this or that)

2. Convergent response (i.e., I can relate this or that to mean…)

3. Divergent response (i.e., from this and that it seems…)

4. Imaginative response (i.e., this has set me dreaming about…)

For a reader to effectively go through these levels, certain skills are required. Allan and Collins (1977) came up with two kinds of comprehension skills that have to be acquired in order to comprehend passages of prose:

1. Comprehension monitoring abilities: The reader invokes these skills in order to keep a check on his ongoing comprehension processes as he reads, to be aware when they break down, and take some effective action to remedy the situation whenever he does so.

2. Hypothesis formation and evaluation: These underlie a student's ability to use various items. They involve more than the recognition and pronunciation of individual words, as they also include the understanding of words in their various contexts.

2.1.2 Theories of Reading

In reading there are several differing perspectives or models of reading and learning to read. Two reading theorists, Smith (1971) and Goodman (1967), believe that comprehension can only be attained if the reader can infer the meaning of various words from the context in which they are presented. Smith and Goodman hold the view that exact decoding is not of primary importance and is not necessarily useful when the reader is seeking to get meaning from text. They emphasise the importance of higher processes, such as the reader's prior knowledge, in controlling the reading process. This prior knowledge refers to the reader's knowledge of words in the sense that he knows their various meanings, not that he knows the exact "correct" pronunciation for decoding.

According to this view, lower processes like decoding are facilitated by this prior knowledge. One does not need, therefore, to be an efficient decoder to be able to get meaning from text. The emphasis is therefore on extracting the meaning of a word from the context. Thus, the reading process would rely heavily on the amount of experience that the reader has with words. His build up of reading comprehension facilitates his understanding of the text and his ability to decode new text. Smith and Goodman both agree that when a reader reads for meaning, he is always in a position to verify whether what he reads makes sense (Smith, 1973). If it does not make sense, he regresses in an effort to locate the point where the error occurred. When he detects the reason for the confusion, he

then reprocesses graphic, syntactic, and semantic information and corrects the errors he has identified (Goodman, 1970, 1976).

In addition, Goodman and Smith believe that all readers utilize self correcting strategies extending or transferring habits and attitudes learnt in connection with listening and speaking to the reading situation (Goodman, 1972). Even when it comes to new words, Smith (1973) states that the most efficient way to determine the meaning of a new word is to infer its meaning from the rest of the text. This technique can however only be acquired through wide reading and predicting, which is only accurate through wide exposure to correct language usage that would in turn help build up the learner's vocabulary.

Considering the rural students, they may find themselves unable to make vital predictions in English that would lead to the understanding of the text, especially where unfamiliar words exist. This is because they have only a limited scope of background knowledge and limited experience with English words to draw from as most of their communication is in their first language. The rural pupil may also be unable to use the self-correcting strategy efficiently as it is likely that they are not competent language users in English since this is their second or third language in which they may not yet be proficient.

Other reading theorists of the same perspective, Yetta Goodman and Carolyn Burke (1972) also hold the view that meaning is gained not from individual words, but from the surrounding context. They contend that when we read we do not

make predictions on the basis of looking at every punctuation mark, letter, word, or sentence. Instead, we select certain aspects of the available language. Because of the background and experience accumulated over the years, we know what is usually significant and select only the most significant cues to make predictions. This model of reading where the reader starts at the higher processes of comprehension and uses this cognitive process to facilitate the lower process of word recognition and decoding is known as the top-down model of reading.

Gough (1970) in Kavanaugh and Mattingly (1972) and Laberge and Samuels (1975) in Singer and Ruddell (1976) have a different approach to reading. In contrast to the top-down reading theorists described initially, the bottom-up theorists assert that it is necessary for children to excel in phonetic decoding and word recognition so as to comprehend the text. They all emphasise the role of first understanding the words singularly as they are presented and then moving from decoding of the word to comprehension. In Gough's model, the reader perceives individual letters and words and then transforms these into phonemic codes. From these codes, the meanings of individual words are ascertained, then syntactic and semantic rules are applied. Once understood, the sentences or phrases are stored in the brain and the process is repeated for the remaining text

Laberge and Samuels' model is similar to Gough's model, but emphasises the roles of attention to particular components of the written material and automaticity, where due to familiarity no attention is paid to some components but

are read 'automatically'. Schneider and Shiffrin (1975) in Laberge and Samuels (1977) emphasise that for a reader to be proficient, the lower processes such as word recognition must be 'automized' or done quickly without conscious attention. Both these models (Laberge and Samuels' and Gough's) also suggest that comprehension begins at word recognition where not only is the word decoded, but meaning is extracted from it. These models are both bottom-up models of reading.

Another bottom-up theorist, Newman (1979) holds that without phonics, which is the backbone of word recognition, it would be impossible for a child who did not know words by sight to make sense of anything he reads. Knowledge of a simple phonetic rule would enable him to decode words and then understand the meaning of each word (assuming that these words are in his meaning vocabulary) and consequently of the entire sentence. Further, Newman criticises Kenneth Goodman and Frank Smith on four main grounds:

1. Smith and Goodman hold that reading provides its own feedback. This means that the reader is able to verify whether what he has read makes sense and if it does not, he regresses to find out where the error occurred. However, Newman observed that many children fail to self-correct what they would almost certainly do in a speaking or listening situation. He suggests that this could be due to inadequate word recognition skills so that even if the word is in his oral or aural vocabulary, he fails to recognise it in its written form.

2. Smith and Goodman contended that readers can infer context accurately through reading. However, Newman observed that many children have been observed to be inefficient readers unable to derive the meanings of words from the surrounding context. From a review of literature he concluded that good as well as poor readers have problems identifying words from context.

3. Both Smith and Goodman believe that phonics is unnecessary to the reading process. Goodman (1972), on one hand, referred to phonics as the irrelevant facet of instruction that diverts the learner from obtaining the meaning. Newman, on the other hand, viewed phonics as an important word recognition tool particularly when it is used with other cue systems to help the reader to recognise words that are in his speaking and listening vocabulary. This would then aid the reader in comprehension.

4. Smith (1973) claimed that the reader who does not read fast enough would have difficulty comprehending. In Smith's view the word-by-word reader is unable to obtain an adequate understanding of what he is reading because his memory system cannot "retain, organise and store the fragmentary information in any efficient way". Newman counters this by the observation of 'snail paced' reading as he calls it, accompanied by comprehension among normal children who are reading orally, material that is conceptually appropriate and that contains words most of which are in their meaning vocabulary.

These criticisms may be seen to be true in the Kenyan situation due to the

limited extent to which the pupil has experience with English words and can use a word in text to infer context and to self-correct. Further, the Kenyan pupil may have no specific training on the use of context to infer the meaning of a word. However, the top-down model cannot be totally ignored in the Kenyan situation as shown in a study by Kiugu (1977). In his study, he assigned 50 words and 50 sentences to standard four pupils, so as to test their reading ability. He had them read out the items aloud and graded them according to the number of correctly decoded items. In this research he did not establish whether decoding had led to comprehension. Interestingly though, he determined that on average, sentences were read better than words. This led him to the conclusion that sentences helped in word recognition.

However, as stated by Eskey (1988), good reading – that is, fluent and accurate reading – can result only from a constant interaction between both the bottom-up and the top-down reading processes. To properly achieve both fluency and accuracy, developing readers must work at perfecting both their bottom-up recognition skills and their top-down interpretation strategies.

More recent theorists have incorporated both these reading models to come up with an interactive reading model that allows for interaction between the lower reading processes and the higher reading skills. One of the proponents of the interactive model of reading is Rumelhart (1978) cited in Samuels and Kamil (1988). According to him, linear models of reading, as are both the bottom-up and

top-down models, pass information along in one direction only and do not permit the information contained in the higher stage to influence the processing of a lower stage. This leads to a serious deficiency.

Samuels and Kamil (1988) view the deficiencies in linear models of reading being the fact that they have difficulty accounting for a number of occurrences known to take place while reading. However, according to them, an interactive model, which permits the information contained in higher stages of processing to influence the analysis which occurs at lower stages of processing, can account for these occurrences in reading. Some of the occurrences and observations are as follows:

1. More letters can be apprehended in a given unit of time if they spell a word than if the same letters form a nonword. For example, more letters are apprehended in a word like *alligator* than in a letter string like *rllaagtio*. Similarly, more letters can be apprehended in a nonsense letter string which conforms to rules of English spelling than in a nonsense letter string which does not conform to English spelling rules. For example, *vernalit* as oppossed to *nrveiatl*.

2. When an error in word recognition is made, there is a strong tendency for the word substitution to maintain the same part of speech as the word for which it is substituted. This relates to the syntactic effects of word perception which are higher order processing skills.

3. Semantic knowledge influences word perception. Samuels and Kamil cite studies by Meyer and Schvaneveldt (1971) and Meyer, Schvaneveldt and Ruddy (1975) who carried out an experimental procedure in which the subject must decide as quickly as possible if a letter string spells a word. It was found that the decision could be made faster when a pair of words is semantically related, as in *bread-butter* or *doctor-nurse*, than if it is semantically unrelated as *bread* and *doctor* or *nurse* and *butter*.

In each of the above examples, the higher order knowledge influenced the processing at a lower stage of analysis. Consequently, Rumelhart came up with a model of reading in which each of the knowledge sources exerts influence upon the text processing and the ultimate interpretation of text. In his model, the higher-order stages are therefore able to influence the processing of lower-order stages. Rumelhart's model is thus able to accommodate the occurrences known to take place while reading that the linear models have difficulty accommodating.

Eskey (1988) believes that the interactive model is able to explain the observed process of reading especially in the context of second language reading. In second language reading, decoding is an important part of the reading process as much as are the higher-level skills of interpretation. These higher level skills are facilitated by rapid and accurate decoding. He stresses that reading should not be limited only to decoding, however, but the reader should be taught and encouraged to make appropriate interpretation of text through the use of top-down reading

stratefies. Both strategies should be developed conjointly, since both contribute directly to the successful comprehension of text.

Another researcher, Carrell (1988), also asserts that the interactive model of reading best describes the reading patterns especially of second language readers, and in fact blames some of the reading problems experienced by second language readers on over-reliance on either top-down or bottom-up processing

This study shall adopt the interactive reading model as the model that best accommodates the subjects in the study.

2.2.0 Assessment of Reading Comprehension Ability

Various methods are used to assess a pupil's reading comprehension ability. The choice of method depends on the theory of reading assumed in the particular reading situation. Three methods that have been used widely are the Informal Reading Inventory (I.R.I.), the Oral Reading Miscue Analysis, and the Cloze Procedure.

According to Betts (1972) cited in Bean (1979), the I.R.I. has been used by teachers and reading specialists as a diagnostic instrument for over 30 years. He describes an I.R.I. as consisting of a series of graded passages which progress in difficulty from pre-primary through eighth grade, followed by five or ten comprehension passages. It is administered on an individual basis where the student reads aloud successively difficult passages while the examiner records oral

reading errors. Errors typically coded include word substitutions, omissions, insertions, repetitions, and words requiring examiner aid.

The I.R.I. has been seriously criticised for its perceived shortcomings. It requires training for one to be able to categorise the reading errors correctly so as to attain accurate scores. It is also time consuming as it is administered on an individual basis. Bean (1979) suggests it is based on an archaic model of the reading process that presents word-for-word accuracy as a gauge of proficient reading. It portrays the reader as a passive reactor to print. It does not take into consideration what effect the departure from the exact text has on meaning.

Other criticism of the I.R.I. was from Rumelhart and Ortony (1977) cited in Bean (1979) who called it a "print-driven" view of the reading process that discounts all that we currently know of the reading process. It does not put into consideration the interaction of the reader with the print.

Another concern raised by Lamberg (1979) is that pupils' pronunciation of words may reflect his own dialect or language. This would result in a pupil being assessed as an incompetent reader as his pronunciation does not accord with that of Standard English speech. This would be true in the Kenyan situation where various dialects exist which do in fact influence the pronunciation of English words. Olaly (1991) was able to demonstrate this fact with Luo speaking children whose pronunciations of certain words was seen to deviate from standard English due to mother tongue speech patterns. Thus, the I.R.I. is not appropriate for use in

the study.

The Oral Reading Miscue Analysis (ORMA) is another procedure for assessing reading proficiency. The ORMA is derived from the model of reading by K. Goodman (1972) which portrays the reader as an active seeker of meaning rather than a passive receptor. The reader reads aloud a passage he is unfamiliar with. The reading is taped and at the end he is asked questions about the passage. The taped reading is analysed for deviations from the written text (miscues) and their impact in attaining meaning.

Goodman believes that during reading, the reader applies selection, prediction, and self-correction strategies to available linguistic cues in print to reconstruct meaning. He considers the commission of miscues in reading as a natural outcome of a reader's active application of prediction strategies, selection of cues, and self-correction behaviour in the reconstruction of meaning from print. Unlike an oral reading error as defined in the I.R.I., miscues are evaluated in terms of the degree to which they preserve or disrupt meaning. The Reading Miscue Inventory (Y. Goodman and Burke, 1972) is a comprehensive approach to the analysis of oral reading miscues that evaluates the reader's use of the full array of cue systems. It however requires a great deal of time to learn and administer.

Apart from being lengthy and involving, the ORMA has been criticised on grounds of its reliability. Mosenthal (1977) reports that children's silent reading scores are superior to their oral reading scores. He attributed this to the fact that

the linguistic competence of children which underlies both their silent reading and oral language processing is not shared by their reading aloud. He discovered that the correlation between the two scores rapidly declines from the third through the eighth grades. This contradicts the major tenet of the ORMA that oral reading miscues faithfully reflect children's reading competencies.

Further, Newman (1978) noted that there are differences in children's eye movements as they read orally and silently indicating that these two processes are different. He also pointed out that silent reading gives them more time than oral reading to think about what is being read.

The scoring in the ORMA has also some problems. Groff (1979) suggests that the administrator is subjective by necessity in that he is required to decide the semantic acceptability of the pupil's miscues without any guidance offered on how to determine certain aspects. The administrator has to determine the basic sense of the plot of the story, which are the deviations in the child's oral reading that seriously interfere with the its subplots, which are the major incidents, characters, and sequences, and which of the deviations in a child's oral reading are significant but do not create inconsistencies within the story. These criticisms suggest that the ORMA may not be accurate in measuring for reading abilities among children and not appropriate for use in this study.

Another common measure of reading comprehension is the Cloze Procedure. This is a technique developed by Taylor (1953) cited in Bormuth (1968). In the

Cloze Procedure words are systematically deleted from a passage, and the reader is expected to replace the deleted word while reading. The Cloze Procedure emphasises the use of the context surrounding the word to aid the pupil in understanding the meaning of the word and of the passage. As an instrument to measure comprehension, the pupil will use the contextual setting of the missing word to determine what the missing word is. It is imperative for the pupil to comprehend the surrounding words and the syntactic and semantic structures of the sentence and even the passage in general. Layton (1979) says that for a student to pronounce a word or attach meaning to it through the use of phonic or structural clues would be one step short of gaining the exact intent of the writer. He asserts that a word has no true meaning without a contextual setting.

A shortcoming of the Cloze Procedure is that it cannot be used in testing for specific sub-skills in comprehension. It is, however, very easy to construct and score even by the class teacher. Unlike the I.R.I. and the ORMA the Cloze Procedure can be administered within a short period of time and it does not require individual testing.

The Cloze Procedure is used widely in the school texts locally and the pupils are therefore familiar with its' application. In addition, this procedure does not limit itself to the use of a specific reading model in the teaching of reading as it does not test the process that ensues before comprehension has taken place. Rather, it tests the results; it answers the question, "has comprehension taken

place?" This test was, therefore, chosen as appropriate for the purposes of this study.

2.3.0 Reading Comprehension and Academic Performance

Some research has been conducted in Kenya in a bid to determine the role of language in the performance in various school subjects. Eshiwani (1982) reported that the poor performance in mathematics in some primary schools could be attributed to the lack of mastery of English language skills among the pupils.

Others have also investigated the relationships of knowledge of English and mathematics. Muola (1990) carried out a study among standard eight pupils to determine the relationship between performance in an English language test and a mathematics test. He obtained a correlation of 0.43 between the pupils' performance in the English language test and their performance in the mathematics test. Kapiyo (1982) also observed a positive relationship among standard seven pupils. He determined that mastery of English language accounted for 0.863% of the total variation in CPE mathematics tests.

Both Munguti (1984) and Muhandik (1984) carried out surveys among pupils and teachers in primary schools. In both studies, lack of mastery of English language was indicated as a factor contributing to the poor performance in Mathematics. This was also the case in a study carried out among secondary school pupils by Mwangi (1983). He found that language mastery by the student

was among the significant factors that influenced a student's performance in Mathematics tests.

Kirigia (1991) conducted a study in which he sought to establish whether pupils graduating from Primary school were equipped with comprehension skills that would help them understand messages that they would meet in out of school situations that were relevant to them. Only 50% of the 120 pupils tested scored above the mean of the reading test. In testing for understanding various messages, he found that the pupils were not capable of understanding messages written in English due to their poor reading comprehension skills.

International studies on the role of language in performance in Mathematics yield results similar to those obtained in the local research. Most have shown reading comprehension abilities of students to be directly related to their scores in arithmetic sub-tests of reasoning or problem solving. In a study among Hawaiian children in kindergarten through grade 3, Brenner (1986) established that reading and mathematics achievement were highly correlated, with reading most highly correlated to the non-computation parts of the mathematics test.

Much earlier, Harper (1957) found such a relationship when he compared reading and arithmetic scores of second grade school children with chronological age and intelligence partialled out. Martin (1963) found that the partial correlation between reading and mathematical problem solving with computation held constant at about .50 was higher at both grade four and eight compared to the

partial correlation between computation and problem solving with reading held constant at about .40. These results suggest a significant correlation between reading ability and performance in Mathematics by use of a t- test.

In his study, Linville (1970) reported that among fourth grade pupils both syntactic structures and vocabulary level were important variables in solving arithmetic problems. He also observed that regardless of treatment conditions, pupils of higher general intellectual ability and/or higher reading ability made significantly higher scores than pupils of lower intellectual ability. From the above studies, reading ability does seem to facilitate arithmetic problem solving and may in fact be a greater determining factor in performance in Mathematics than in problem solving ability.

Some researchers suggest however that the relationship between Mathematics and reading comprehension may not be very high for older pupils. Hamilton (1953) reported that the low correlation that was obtained between Mathematics and English test scores of first year senior secondary students could be interpreted to mean that an increase in general reading ability may not automatically provide the substructures for improvement in reading mathematics material at higher levels.

Other international research too has been conducted with regard to other school subjects and their relationship with reading ability. Parrott (1986) in seeking to identify predictors of students' eventual performance in class, found that in five of

the seven social studies courses tested, mean reading score decreased as course grade decreased. He further established significant relationships between students' grade outcomes and their ability to read and write.

In earlier studies, Krantz (1957) cited in Kapiyo (1982) determined that the two best predictors of social studies achievement were reading vocabulary and comprehension. Hinkleman (1956) reported that significant relationships existed between reading success and success attained in social studies by eighth grade students. These studies suggest a positive correlation between performance in social studies and reading comprehension.

However, Sochor (1958) and Maney (1958) cited in Anderson and Freebody (1979) differed on this opinion. They conducted two significant and mutually supporting studies, which looked at the relationship among general reading, intelligence and critical and literal comprehension in social studies and science. In each study, a context test, reading test and intelligence test were given to fifth grade students. Both researchers found striking parallels. The reading test did not measure specific sub-skills in reading but reading comprehension as a whole. They separately concluded that general reading performance was not a positive indicator of either literal or critical reading achievement in science or social studies.

This conclusion was supported by a study by Peters and Kaufman (1975), also cited by Anderson and Freebody (1979), that indicated that a good comprehender of social studies or science text may not necessarily be a good comprehender of

literature or mathematical material.

Taken together, these studies suggest that different skills are required for comprehending different types of text. It is therefore expected that the relationship between reading comprehension and the various school subjects shall be of different values and hence the need to investigate the relationship for several subjects.

In the area of Science, Shores and Saupe (1953) conducted a study of fourth, fifth and sixth grade students' abilities to read for problem solving in science; they correlated the results with the students' scores on a mental maturity test and an achievement test. The researchers concluded that the variable of reading for problem solving in science contained less of a general factor than the other tests. They suggested that specific reading abilities are required in the reading of science text. This did not rule out, however, a relationship between comprehension of science text and general reading comprehension ability.

In investigating this relationship, Sochor (1958) asserted that reading comprehension was related to comprehension of science text. He emphasised, however, that it is important in science reading for the student to be able to remember symbols, formulae, specific vocabulary terms and procedures for conducting experiments if they are to be efficient as well as proficient in the application of science reading.

The implication from these studies is that general reading comprehension ability does not necessarily imply an ability to comprehend text in all the various school subjects. This would suggest that the magnitude of the relationship between reading comprehension and academic performance would depend on the subject under study. It is expected that the relationship between reading comprehension and arts subjects would be significant as these comprise mainly of written English text and do not comprise the use of symbols.

In Science and Mathematics, no differentiation was made within the studies described in this review for word problems and symbolic problems, as they relate to reading comprehension. It is expected, therefore, that as a whole, these two subjects would correlate positively with reading comprehension, but that the relationship would be higher for word problems and reading comprehension than for symbolic problems and reading.

Some other international research identified the role of intelligence and reading comprehension in performance in school. This research though old identified the role of intelligence, and does provide an important backbone to investigating locally what relationship there is between reading and the various school subjects. For example, in a generalised study, Cooper (1955) studied student scores in various subject areas and determined reading ability in all subject areas to be related more to total intellectual and language abilities than to any separate or specific variables. Thus, the role of intelligence needs to be considered.

2.4.0 Intelligence and Reading Comprehension

According to Harris and Sipay (1975), intelligence is the most important variable in learning to read and is especially important to the ease with which children will learn to read. They also contend that children with mental ages below six years have higher failure rates in first grade than those who are mentally above six years. They, however, warned that it is erroneous to think that children must reach a mental age of six to be able to read but agreed that intelligence is a very important variable influencing the rate at which reading skills will develop.

Cohen (1970) in Sullivan (1972), posted three conditions that are involved in the development of human intelligence. According to Cohen, children must be able to:

1. Attend or concentrate on stimuli

2. Form a permanent memory trace

3. Develop a retrieval system through which the memory is scanned or focused.

He states that these three abilities are necessary for language learning, intellectual development and learning to read.

Other theorists have also indicated a relationship between reading and intelligence. Bond and Tinker (1967) reported that there was agreement between reading scores and intelligence quotients of children whose scores were between

90 and 110. Edwards (1971) identified language growth as the one single source of information that gives us the most information about children's intelligence. Bloom (1970) in Robeck and Wilson (1974) estimated that 50% of intellectual growth occurs before age five and 30% before age eight. These estimates were based on the vocabulary tests that were used to measure intelligence. In similar findings, separate studies by Sochor (1958), and Maney (1958), cited by Anderson and Freebody (1979), showed that literal and critical reading are positively related to intelligence.

However, some researchers oppose the use of intelligence test scores to predict the success children will achieve in their initial attempts to read or the use of intelligence test scores to compute the reading expectancy levels of those children who have learned to read at some measurable level. Spache (1976) contended that there was no essential mental age for beginning reading and that children with the same mental ages may not progress at the same rates in developing reading skills. He considered the relationship of mental age to that of reading to be statistically moderate for children in primary grades. An example of this is seen in a very early study conducted by Witty and Kopel (1939) which showed some severely retarded readers having an average and some even better than average intelligence.

Most studies support the existence of a relationship between comprehension and intelligence though the significance and direction of this relationship varies from study to study. For example, Stanovich et al. (1980) conducted an extensive

study where they administered measures of general intelligence, decoding speed, reading comprehension, phonological awareness, and listening comprehension; all of these measures were moderately related to end of year reading comprehension. Among their first grade subjects (6 yr.), intelligence accounted for 18.6% of the variation in reading comprehension ability, 36.7% among third grade subjects (9 yr. 1mth), and 42.5% among fifth grade subjects (11yrs. 3mths). In their study, the correlation between reading and intelligence for first, second and third graders were .33, .42, and .56 respectively. There was not significant difference between these correlations. They concluded that general intelligence is a moderate predictor of reading ability. They stressed however, that reading comprehension cannot be said to be largely a matter of general intelligence as this assertion ignores developmental trends and fails to recognize the importance of many critical sub-skills that are only weakly related to measures of general intelligence.

Other studies cited in Stanovich et al. (1980) have yielded a much higher correlation for subjects of grade 9 and above (age 14 and above). Andrew (1978) had a correlation of .71, Glossop et al (1979) had .82, Guterman (1979) had .64, and Yule et al (1979) found a correlation of .61. However, Stanovich in summarising these findings suggested that poor reading skills cannot be automatically attributed to low intelligence level in pupils.

The studies above indicate that the magnitude and significance of the relationship between reading comprehension and intelligence varies depending on

various variables including the subject's age and the particular skill in comprehension being assessed. In this study, the reading comprehension ability as a whole was assessed among pupils of age 13 and above. Since the study did not break down reading comprehension into various components, it was expected that the relationship obtained between reading comprehension and intelligence would be significant due to the various facets of reading that appear to load heavily on intelligence, as seen in the reviewed studies. Research also suggests that relationship is greater for older pupils. This also was expected to contribute to a significant relationship.

To measure intelligence, reasoning ability which is a subset of Intelligence and Developmental Tests of East Africa (IDEA) shall be used. According to Bali (1983), reasoning ability accounts for the largest percentage of variance in intelligence (22% in comparison to other factors), and can therefore be used to infer intelligence. As this is a test specifically developed with and for East Africa subjects, it reduces the possibility of test bias due to different cultural settings.

2.5.0 Gender and Reading Comprehension

Generally, research seems to suggest that girls are better readers than boys are especially at the lower ages of ten and below. Harris and Sipay (1975) suggest that girls are generally ready to read earlier than boys probably as a result of school related activities that girls experience to a greater degree prior to school

entry.

Eshiwani (1975) conducted a study in Kenya in which he administered, among other tests, a comprehension of mathematical vocabulary test and a comprehension of science vocabulary test. Having found no significant difference in attitudes towards mathematics between boys and girls, he randomly assigned the subjects to programmed instruction, conventional classroom approach and integrated programmed instruction. In the programmed instruction and integrated programmed instruction groups, girls performed better than boys in the math retention tests. In the conventional classroom approach group, the boys performed significantly better than the girls did. He concluded that gender differences observed in Kenyan high schools in achievement and retention of mathematics are due to the method of instruction. He suggested that girls are better readers than boys are and can therefore learn more effectively from programmed instruction than from a teacher.

Other studies have found a difference between the reading abilities of boys and girls though not significant. Using 482 girls and 464 boys aged ten, Heilman (1961) measured a number of facets of reading and reported that the total reading scores favoured girls. The difference, however, was not statistically significant at the 0.05 level of significance.

Dale (1998) also found that although girls of ages seven to twelve years performed better in reading than boys of the same ages, gender was not a predictor

of the rate of growth in reading comprehension at the 0.1 level of significance.

Kiugu (1977) in his study reported that among nine to ten-year old pupils in Kenya, girls surpassed boys in reading of sentences, although the boys performed better than the girls did in the reading of single words. These differences however were not statistically significant.

According to some researchers, these different findings can be attributed to cultural factors. An extensive study by Dale (1974) considered sex differences in reading among subjects from Canada, England, Nigeria, and United States. The subjects from these English speaking nations were in grades two, four, and six. The Nigerian subjects were one year older than in the other three countries and the boy to girl ratio for all four countries was 3:1. All subjects were administered the Gates-Macginite reading test. In Canada, 14 of 18 mean scores favoured girls but only six of the scores were significantly different. In England, girls had higher scores than boys on 11 of the 18 comparisons. In Nigeria, boys exceeded girls on 15 of the 18 tests. In USA, the mean scores of girls were higher than those of the boys in 15 of the 18 tests. Only in the US did girls consistently surpass boys across the three grades.

These results were generally consistent with the teachers' beliefs. For example, 80% of the Canadian teachers judged girls to be better readers than the boys, while in Nigeria, teachers expected boys to read better

Dale suggested that gender differences could be attributed more to cultural rather than physiological factors. Proportionately more children in Canada and the US were taught by female teachers, while in Nigeria and England, proportionately more were taught by male teachers. This seems to suggest that the gender of the teacher may influence the performance in reading of the students.

Teachers' expectation of pupils performance may also be a contributing factor as reflected in the results of Canadian and Nigerian subjects. These teachers' expectations may be a reflection of the prevalent cultural expectations.

Downing (1977), in seeking to investigate cultural attitudes towards reading, conducted a study with a cross section of age groups ranging from six year olds to adults, and divided these into six groups. Each group was presented with a series of 12 drawings of stick figures each performing a different activity. Subjects were then asked to indicate whether the pictured activity was more suitable for a six-year old boy or girl. In every subject group except six-year old pupils, there were significantly more responses of "girl" than "boy" to the drawing of the stick figure engaged in reading. He suggested that gender differences in reading achievement are more related to cultural expectations than to maturity.

Castle (1988) explained the differences in reading abilities of boys and girls as caused by the fact that seem to have a maturational lag which is further reinforced by their play activities which were visuo-spatial in nature while girls engaged in play activities that were passively linguistically oriented. This was seen to be to

the detriment of their beginning to read skills.

These contradicting findings reflect the reality that there are many factors that influence gender performance in reading. Findings vary therefore depending on the population under study.

In rural Kenya, traditionally it was largely believed that it was more important to educate a boy rather than a girl. However, values in the past years have changed as the benefits of education even among the girls have begun being evident. In addition, the pupils in the study are of age 13 to 15, and as the reviewed research suggests, the gender differences in reading are less as the age of the pupils increase. The difference in the performance of boys and girls in reading was therefore not expected to be significant.

2.6.0 Research Hypotheses

From the literature reviewed, it is apparent that there is a relationship between performance in English and performance in Mathematics (Muola 1990, Munguti 1984, Muhanduk 1984, Mwangi 1983, Kapiyo 1982). Since performance in English is associated with reading comprehension, it is expected that there will be a positive relationship between performance in Mathematics and reading comprehension. Performance in the social studies and Science is also expected to positively relate to reading comprehension (Kapiyo 1982) especially because the examinations taken by the pupil mainly consist of recall questions.

It is also expected that a pupil's intelligence will relate to his reading comprehension ability as prior studies have indicated (Stanovich et al 1980, Edwards 1971, Bond and Tinker 1967). Most research on gender differences in reading comprehension indicates that girls perform better than boys (Harris and Sipay 1975, Eshiwani 1975, Heilman 1961). However, due to cultural considerations which to some extent determine this gender bias, (Dale, 1974), it is expected that there will be no significant difference in the performance of boys and girls in reading comprehension. The following are therefore the research hypothesis of this study:

1. There is a positive relationship between reading comprehension and academic performance in some subjects.

2. There is a positive relationship between reading comprehension and intelligence.

3. There are no significant gender differences in the pupils' reading comprehension.

CHAPTER THREE

METHODOLOGY

3.1.0 Introduction

This is a descriptive study whose aim is to describe in correlational terms, the relationship, if any, between reading comprehension and academic performance in subjects studied in primary schools. The study has also considered possible relationships between reading comprehension and intelligence, and also possible gender differences in reading comprehension.

The research design, variables, population under study, sampling procedures, data gathering and scoring techniques, and analysis procedures are discussed in this chapter.

3.2.0 Research Design

This study employed an ex post facto design. This means 'from what is done afterwards' (Cohen and Marion, 1980). In the context of social and educational research, the phrase means 'retrospectively' or 'after the fact'. In this study, the researcher had no direct control over either the academic performance of the pupils or of their reading comprehension. The researcher examined, therefore, in retrospect possible relationships between these variables.

3.3.0 Variables

Main variables.

1. Academic performance - This refers to the pupils' performance in the end of the previous years' District Exams in the primary school subjects. The subjects under study are English, GHC, Kiswahili, Mathematics, and Science.

2. Reading comprehension- This is used throughout this study to refer to a pupils' ability to understand text in a given story.

Other variables.

1. Reasoning abilities- This is representative of general intelligence. It refers to the pupils ability to reason inductively through set logical questions and mathematical reasoning (Bali, 1983).

2. Gender- Pupils were classified into two main groups,

   a. Males

   b. Females

3.4.0 Statistical Hypotheses

There were three categories of issues to be investigated. The hypotheses in this section shall be discussed as per the categories. Category one is further divided into the various subject areas.

1. The relationship between reading comprehension and academic performance in:

    a. English

    b. GHC

    c. c..Kiswahili

    d. Mathematics

    e. Science

Hypothesis 1

H_A: At the 0.05 level of significance, there is a significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in English.

Ho: At the 0.05 level of significance, there is no significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in English.

Hypotheses 2

H_A: At the 0.05 level of significance, there is a significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in GHC.

Ho: At the 0.05 level of significance, there is no significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in GHC.

Hypotheses 3

H_A: At the 0.05 level of significance, there is a significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in Kiswahili.

Ho: At the 0.05 level of significance, there is no significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in Kiswahili.

Hypotheses 4

H_A: At the 0.05 level of significance, there is a significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in Mathematics.

Ho: At the 0.05 level of significance, there is no significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in Mathematics.

Hypotheses 5

H_A: At the 0.05 level of significance, there is a significant correlation among

standard 8 pupils in rural Machakos District between reading comprehension and performance in Science.

Ho: At the 0.05 level of significance, there is no significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and performance in Science.

2. The relationship between reading comprehension and intelligence.

Hypothesis 6

H_A: At the 0.05 level of significance, there is a significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and intelligence.

Ho: At the 0.05 level of significance, there is no significant correlation among standard 8 pupils in rural Machakos District between reading comprehension and intelligence.

3. The effect of gender on reading comprehension

Hypotheses 7

H_A: At the 0.05 level of significance, there is a significant effect of gender on pupils reading comprehension.

Ho: At the 0.05 level of significance, there is no significant effect of gender on

pupils reading comprehension.

3.5.0 Population

For the purpose of this study, subjects needed to be from similar geographic, social, and economic settings. This acted as a natural control for otherwise confounding factors. These are factors such as different language experiences, different levels of exposure to English, and different socio-economic background. A rural area was therefore considered to be appropriate as most pupils attending the rural primary schools live in the neighbouring villages.

The study was carried out in Machakos District. Earlier studies (Munguti, 1984; Muola 1990) had already established that the English language experience and mastery of the English language among pupils in rural Machakos was lower than the expected level for their class. A study among this population investigating the relationship between their reading comprehension abilities and academic performance would build on this earlier research as it would clearly show how their poor mastery of English language, and specifically reading comprehension, relates to their academic performance. Another study was being carried out concurrently among the same population, comparing the performance of word problems and symbolic problems in Mathematics. These studies together would enhance the knowledge to be gained among this population, hence the selection of this site.

Since standard eight pupils have had a long exposure to reading and learning in English and are preparing for their End of Primary School Examinations, the Kenya Certificate of Primary Education, they should have grasped the concepts of primary school English comprehension being tested. The research was conducted at a time when the pupils were preparing for the terminal exams. It would be important to know whether performance in English would have impacted their performance in the terminal exams. For this reason, the standard eight pupils were tested from each of the schools in the study.

3.6.0 Sample and Sampling Techniques

The nine divisions of rural Machakos District were randomly sampled and Mwala Division was selected as the representative division of rural Machakos District. From Mwala Division, a total of six primary schools were selected for this study as a representative sample of the entire population. Each school would contribute 40 pupils for the study. 240 pupils was the anticipated sample size. Six primary schools were therefore selected. These schools were selected by means of purposeful selection and then random selection. This technique was selected because certain characteristics were necessary for this study. These characteristics are described below.

1. The schools chosen must be representative of schools in rural Machakos District.

2. Only schools that participated in the previous years' end of year District exams were to be included. This is to avoid exam bias in academic scores which would arise from the fact that individual schools would test for differing areas of learning depending on the inclination of the examiner, and employ different methods of awarding marks for the questions. The District exams would eliminate this bias.

3. Each school was required to have at least 20 boys and 20 girls in the standard eight classes.

Having selected the schools that met the above requirements, six schools were randomly selected, from which the representative pupils were selected by means of stratified random sampling. The populations were divided into gender strata; in each school, boys and girls each comprised an individual stratum. From each stratum, a simple random selection was made of 20 pupils. This gave a total of 40 pupils per school for each of the six schools, and therefore a total sample of 240 pupils.

During the test administration however, one school was dropped from the study as the pupils were unavailable during the time allocated for the study. In addition, the number of pupils available in the remaining schools diminished during the study because some pupils had been sent home due to school fees arrears. This left a sample size of 116 pupils comprising of 65 boys and 51 girls.

3.7.0 Test Instruments and Scoring Procedures

In this section, the various test instruments shall be described and the scoring methods employed.

3.7.1 Reading Comprehension Test

The comprehension test was to be based on the Cloze Procedure, the Maze Procedure or both. To determine which of the tests would be suitable, it was necessary to pilot a cloze-based reading comprehension test and a maze-based reading comprehension test. The results obtained would then indicate which test was appropriate.

The Cloze Procedure Test.

The Cloze Procedure is a technique developed by Taylor (1953), cited in Bormuth (1968), in which words are systematically deleted from a passage, and the reader is expected to replace the deleted word while reading. In a Cloze test, the reader's task is to work out from the surrounding context which word has been omitted and to insert the one that seems most appropriate in each blank space. According to Harrison (1979) the scores a reader obtains on a number of passages will vary according to how difficult each passage is to comprehend.

Example of the Cloze Procedure test.

Shops which sell clothes, particularly women's clothes, are seldom empty. They are found in most Kenya towns. _____ they have displays of many

coloured clothes in the _____ .Sounds of music may be heard from a record player _____: this is supposed to make customers to buy.

(Source: Curtis, A. Four Skills English: A Primary Course. Nairobi: Oxford University Press. P. 21.)

Scoring of the Cloze Procedure test.

The correct response is:-

1 One that exactly replaces the missing word

2. One that is a synonym to the missing word e.g. "Commonly " instead of "Usually"

3. One that does not change the meaning of a passage and no clues exist in the context to indicate that the response given is not the correct response . e.g. _____ they have displays of many coloured clothes in the _____.

The missing words are "Usually" and "windows". However, a pupil may insert "Sometimes" instead of "Usually" and this neither changes the meaning of the passage, nor does the context suggest that it is incorrect. However, if the pupil fills in the second blank with the word "shirt" this is a wrong response as it does not fit into the context of the story.

Any correct or appropriate response was awarded 2 marks and no marks were awarded to any response outside of the 3 categories of correct or appropriate

responses.

The Maze Procedure test.

The Maze Procedure is a variant of the Cloze Procedure suitable for young and poor readers. In the procedure, instead of deletions as in the Cloze Procedure, multiple choice items are provided.

Example of the Maze Procedure test.

Shops which sell clothes particularly women's clothes are seldom empty. They are found in most Kenya towns. [Usually, Never, Good] they have displays of many coloured clothes in the [door, joyfully, windows]. Sounds of music may be heard from a record player [inside, book, here]: this is supposed to make customers want to buy.

Scoring of the Maze Procedure test.

Every correct response chosen was awarded two marks. No marks were awarded for the choice of an incorrect response.

3.7.2 Academic Performance

To measure the pupils' academic performance, individual scores on the previous years' District exams were utilized. These exams were chosen as appropriate because they provide a uniform measure of academic performance across the sample. This eliminated test bias in performance.

Scoring of academic performance.

Pupils' scores in the relevant subject areas as given by the District exams were used. From these scores the average academic score was calculated and expressed as a percentage.

3.7.3 Intelligence

To measure intelligence, a reasoning ability test which is a sub test of intelligence was used. The test battery is the Intelligence and Development test for East Africa (IDEA).

The Intelligence and Development Test for East Africa

This test was chosen as appropriate since it is especially developed for subjects in East Africa. The IDEA battery consists of 15 sub-tests and is therefore referred to as a battery. These sub-tests were observed to measure closely related traits (Bali, Drenth, Van der Flier and Young, 1984). According to Bali et al. (1984), the battery has construct validity. The sub-tests loaded significantly on general intelligence factor and the battery therefore gave a measure of the pupils' general intellectual ability. A varmix rotation carried out on the IDEA sub-tests found that five chosen factors - the General reasoning, Perceptual Speed, Fluency, Spatial ability and Memory, loaded heavily on the subtests with the General Reasoning factor accounting for the greatest variance of 22% of the total variance. General Reasoning can therefore be used to infer intelligence.

The IDEA sub-test that had the greatest loading on the General Reasoning factor were the Figure Exclusion (0.62), Word Exclusion (0.77), Symbolic Exclusion (0.69), Word Analogies (0.77), and Mathematics (0.74). These sub-tests were therefore selected for use in this study as a measure of a pupils' reasoning ability.

Below is a summary of the contents of the sub-tests:

1. Figure exclusion: In rows of five geometrical figures, four are similar in some respect. The figure that does not accord with the principle must be identified by the examinees.

2. Word exclusion: Rows of five words are represented, four of which are similar in some respect. The task of the examinee is to indicate the word that does not belong with the rest.

3. Symbol exclusion: For each item, there are five groups of numbers or letters. Four of these are similar in some respect. The task is to indicate the one that does not fit the rule.

4. Word analogies: The examinee is presented with analogies in which the last word is missing. The missing word has to be chosen from five alternatives.

5. Mathematics: This test measures facility in simple numerical computations (Number facility). It consists of addition, subtraction, multiplication, and division

sums. The correct solution for each item must be checked from five alternatives. (Bali, 1983)

Scoring the IDEA Intelligence Test.

The IDEA test is a multiple-choice formatted test. Each correct response was awarded one mark and no marks were awarded for incorrect responses.

3.8.0 Data Gathering Sources and Procedures

Data was collected mainly from the following three primary sources:

1. School records to identify the following information about the subjects:-

   a. Academic performance in the school subjects in the previous years' End of Year District Exams.

   b. Gender

   c. Relevant demographic data including. age of entry to school, classes repeated, current age.

2. Scores on the reading comprehension test administered to the pupils.

3. Scores on the Reasoning Ability Test.

3.8.1 Overall Data Gathering Procedures

Having obtained permission from the relevant university and government authorities, the pilot test was conducted in a randomly selected primary school in Machakos district after which the results of the pilot testing were analysed. More data was then collected from the schools participating in the study, which were selected through random sampling. The data was then analysed and conclusions drawn from the realised results.

3.9.0 Piloting

A pilot test was conducted before the research data collection was carried out. The piloting was done among standard eight pupils in a randomly selected primary school in Machakos district, which was not participating in the main research.

3.9.1 Rationale for Piloting

The reading comprehension test was piloted to provide an appropriate test for the study. The pilot study was conducted three weeks before the main study. It was conducted among standard eight pupils in a school in rural Machakos District. The aim of the pilot study was to assist in choosing the passage that would be used for the Reading Comprehension test in the study and also to determine whether the test would be administered in the Maze Procedure or in the Cloze Procedure.

3.9.2 Procedure of Piloting

Three passages were administered to the pupils in both the Cloze and the Maze format. These passages were extracted from standard six and seven readers which the pupils had not used before. Standard eight readers were not used as the pupils have not yet attained the skills necessary to read these texts since this was the first term of school. The sample size for the pilot study was 31 pupils comprising 16 boys and 15 girls.

After the pupils had been instructed on what was expected of them in each of the tests, they answered the three tests by use of the Cloze Procedure. A total of 15 minutes was allowed for each test, with five minutes break in between each test to allow for collection of the answer sheets and distribution of the next test. Having completed the Cloze tests, the pupils were allowed a break of 15 minutes and then they took the next three tests which required use of the Maze Procedure. The timings allowed were similar to those of the Cloze Procedure tests.

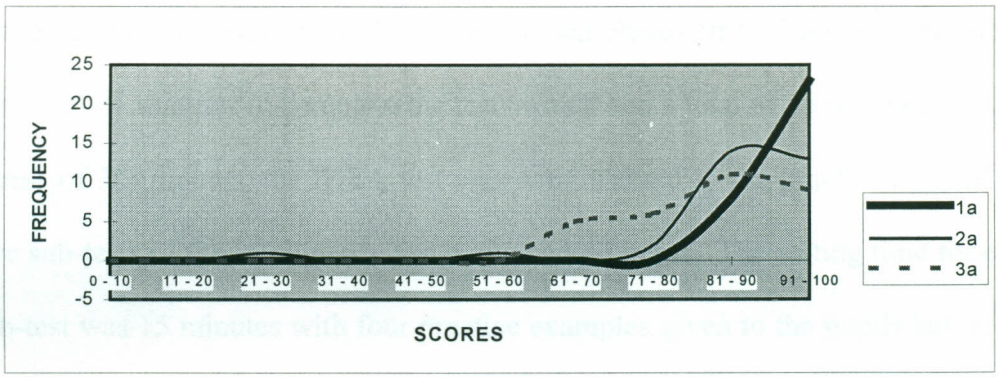
Pupils were asked to indicate which of the three passages was most interesting to them. This would further help in choosing a passage for the final testing.

3.9.3 Results of the Pilot Test

The results obtained in the pilot testing are presented in this section in graphical form for both the Maze and Cloze Procedure

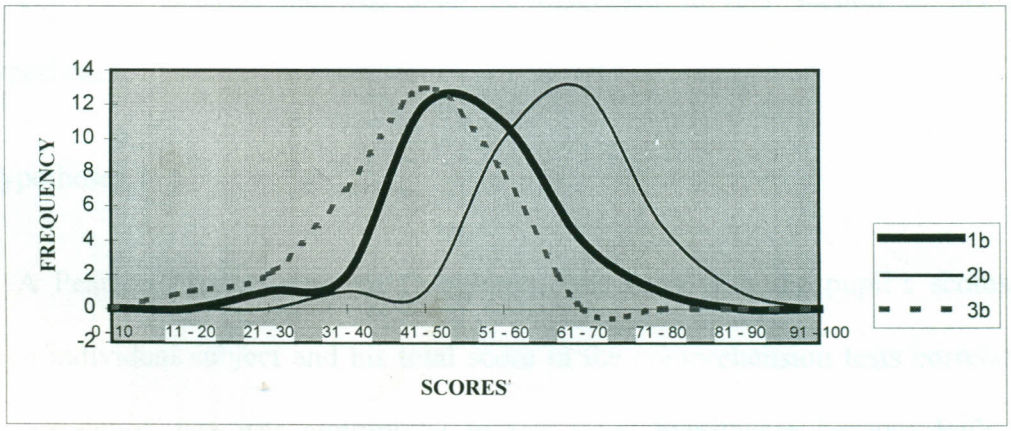
Considering Graph 3.1 below, graphs 1a, 2a, and 3a, which show the distribution of scores in the Maze Procedure are all positively skewed. This suggests that the Maze test was not a valid test for the selected passages as it was unable to discriminate between poor, average, and good performers.

Graph 3.1 Distribution of scores in the Maze Procedure tests.



In contrast, the Cloze test was quite discriminative as seen in graph 3.2. Graphs 1b, 2b, and 3b show the distribution of scores in the three tests. All have a normal

Graph 3.2 Distribution of scores in the Cloze Procedure test



distribution of scores. Since only two passages were required for the final testing, passages 1b and 2b were chosen as these were indicated as being the most interesting to the pupils. These are based on the Cloze procedure.

3.10.0 Specific Testing Procedures During the Study

With the subjects of the study chosen, comprehension tests were administered to the pupils. The pupils took these tests in their classrooms. They were allowed a period of 45 minutes to complete the tests which had a total of 56 questions. After recess of 30 minutes, the IDEA test was administered to the pupils. Each of the five sub-tests of the Intelligence test contained 40 items. The testing time for each sub-test was 15 minutes with four practice examples given to the pupils before the administration of each test in order to facilitate their understanding of the instructions.

3.10.1 Data Analysis of the Hypotheses

The data analysis methods shall be discussed in this section as per the hypotheses.

Hypotheses 1- 5

A Pearson Product-moment Correlation was used with the pupil's scores in each individual subject and his total score in the comprehension tests correlated. A correlation test was appropriate to test these hypotheses because both the

academic scores and the comprehension test scores were raw scores and a correlation test is totally independent of the scale in which either one is measured. A t-test of significance at the 0.05 level was applied to the obtained correctional value to test for the significance of the correlation.

Hypothesis 6

To test for the relationship between reading comprehension and intelligence, the Pearson Product-Moment Correlation was used and a t-test used to test for the significance of the relationship, if any, at the 0.05 level of significance.

Hypothesis 7

To test the effect of gender on reading comprehension, the student t-test was employed using the 0.05 level of significance. Further, the scores in academic performance were correlated with the scores in the reading comprehension test separately for boys and girls and the differences in the correlations and the significance of the correlations compared.

CHAPTER FOUR

DATA ANALYSIS

4.1.0 Introduction

This chapter presents the research data and findings. First, the results of the variables in the study are presented: that is, reading comprehension, academic achievement, and intelligence. This is followed by the summary of the results of the hypotheses testing. Tables and graphs are used to depict the important descriptive characteristics of each of the variables in the study and their relationships.

4.2.0 Descriptive Findings

Correlation values were obtained for reading comprehension and performance in English, GHC, Kiswahili, Mathematics and Science. Reading comprehension was found to be related to all the school subjects tested, in varying magnitude. Further, correlation values were obtained for reading comprehension with intelligence and gender.

4.2.1 Overall Demographic Data

Having selected the schools and the pupils to be involved in the study, the data was collected school by school. The school records provided information on the

pupils' academic performance in the previous years' End of Year District Exams. Relevant demographic data was collected from the teachers and head teachers.

The data indicated that in rural Machakos, the residents are mainly small scale farmers with only one parent, if any, being in employment. The population is mainly of low social economic status with the average home having one parent, usually the father, in casual employment while the mother attends to the household chores and engages in subsistence farming. The school buildings are a combination of permanent and semi-permanent structures. The average number of pupils in a primary school is 300, with the typical school having two streams each in standards seven and eight.

The average reported age of the pupils in the study was 15.3yrs. 65 pupils were at or above average, and 51 pupils were below average age. The age range was 13-18 years old. Of the 65 pupils that were above average age, 51 of them had to repeat the earlier classes. Pupils are not allowed to proceed to the next class until they have passed the End of Year Exams of their current class. On the same principle, the schools do not admit pupils into standard eight until they have passed the End of Standard Seven District Exam. The educational opportunities for boys and girls are somewhat equal as suggested by the small difference between the number of boys and that of girls in the selected sample that comprised of 65 boys and 51 girls.

Participation in school is limited for some children because of family financial

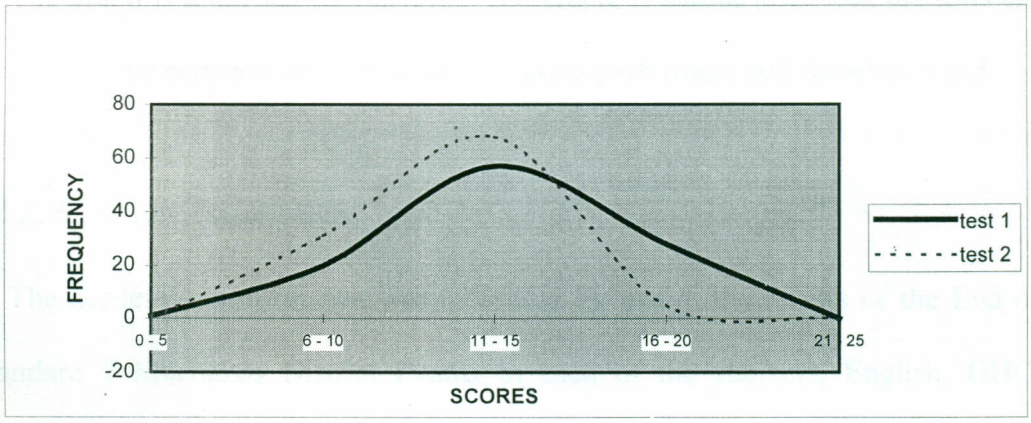
constraints. Some of the pupils enrolled into standard one having exceeded the required six years old entry age, due to various reasons, the most common of which was unavailability of school fees. Dropout cases in the schools were not uncommon, again mostly due to lack of school fees.

In each of the sample schools, more than half of the number of teachers was trained. The untrained teachers mainly comprised of KCE and KACE graduates. The average teacher-pupil ratio was one teacher to every 29 pupils.

4.2.2 Reading Comprehension

In this section, pupils' scores in the two reading comprehension tests are analysed. The graphic representation of the scores is shown on Graph 4.1.

Graph 4.1 Scores in the reading comprehension tests.

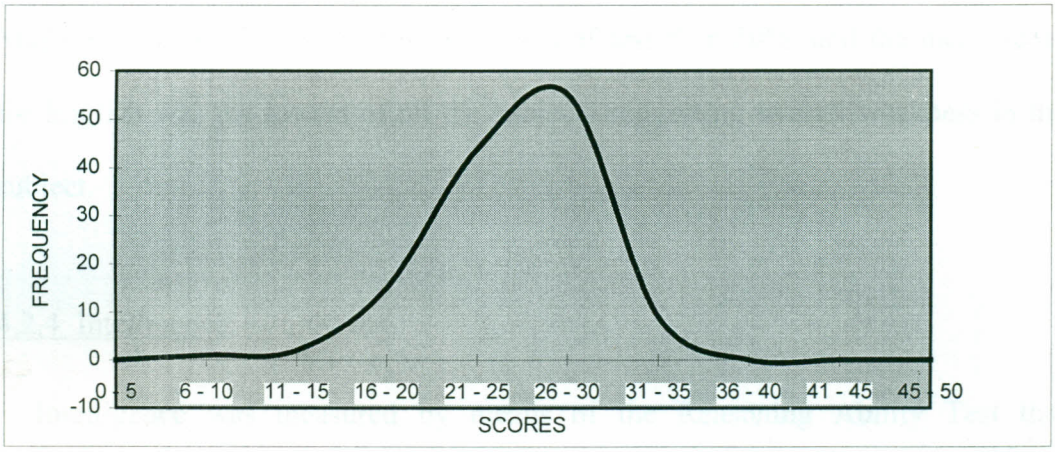


As can be seen from the graph, both tests gave an approximation of a normal distribution of scores. The distribution for Test 2 had a lower number of pupils in

the upper percentile. However, most of the pupils scored around the mean with a standard deviation of 2.19 from the mean as compared to 2.96 for Test 1.

Graph 4.2 below shows the distribution of the scores when performance in the two tests is summed up.

Graph 4.2 Distribution of total scores in the reading comprehension test



The graph is a normal curve. From the graph, it can be seen that the tests are discriminative between poor, average, and good performers and therefore valid.

4.2.3 Academic Performance

The academic performance was measured by use of the results of the End of Standard 7 Machakos District Exams in each of the subjects, English, GHC, Kiswahili, Mathematics, and Science. A summary of the descriptive statistics is presented in Table 4.1.

Table 4.1 Pupils scores in district exams.

	Mean	Median	Std. Dev.	Min. Score	Max. Score	Upper Quartile	Lower Quartile
English	47.36	47	10.27	22	75	53.5	42
GHC	54.4	54.5	11.54	29	79	62.5	46
Swahili	55.13	55.5	9.14	29	76	62	49
Math	48.42	50	16.9	12	92	61	34
Science	59.41	58	8.85	38	83	65	55

The highest score and lowest score in any subject was in Mathematics. Both Mathematics and English had mean scores of less than 50%, and the mean score for English was the lowest of all the subjects suggesting overall weakness in the subject.

4.2.4 Intelligence

Intelligence was measured by means of the Reasoning Ability Test that comprised of 5 sub-tests. Table 4.2 is a presentation of the pupils mean scores and standard deviations in each of the sub-tests. The table indicates that most of the

Table 4.2 Statistical summary of scores in the Reasoning Ability sub-tests

Subtest	Mean	Standard Deviation
Mathematics	98.6	2.08
Word Exclusion	43.5	9.15
Symbol Exclusion	48.6	15.4
Word Analogy	46.1	16.7
Figure Exclusion	56.0	10.9

pupils excelled in the mathematics sub-test, which was a measure of their numerical facility. In contrast, the mean scores in the Word Exclusion and Word Analogy sub-tests were the lowest out of the 5 sub- tests. Further, the variation in the Word Analogy test was the greatest. These two sub-tests required that the pupil be able to comprehend the words presented in the question so as to be able to fill in the missing word or pick the odd one out.

The scores in the Reasoning Ability tests were added and the total scores tabulated to indicate their general reasoning ability. These are presented in Table 4.3.

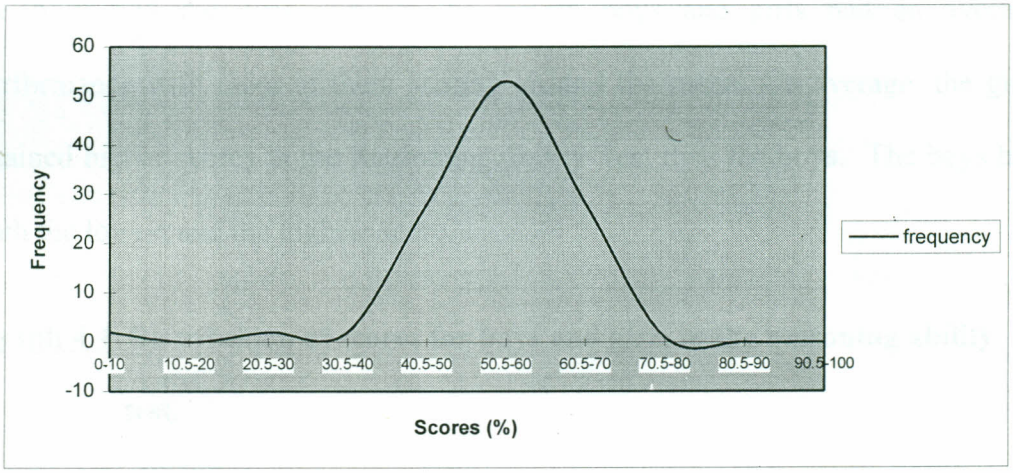
Table 4.3 Summary of scores in the Reasoning Ability test.

Mean	Median	Mode	Std. Dev.	Min. Score	Max. Score	Skewness
53.44	55	50.5	10.98	0	73.5	-2.178

The scores in the Reasoning Ability test were very widely distributed with a standard deviation of 10.98. The scores gave a negative skew of 2.178 indicating that more pupils attained higher than the modal score.

Graph 4.3 indicates that there was a normal distribution of scores although a few pupils had extremely low scores. Most of the pupils scored within the 40% - 60% range. A comparison of the performance of boys and girls in the Reasoning Ability test is discussed in the next section on gender

Graph 4.3 Distribution of scores in the Reasoning Ability test.



4.2.5 Gender

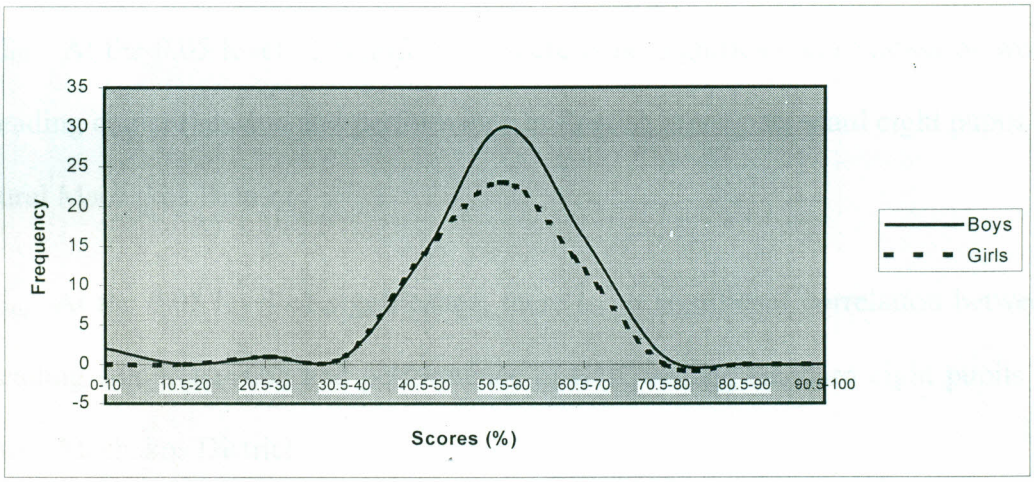
The Table 4.4 shows the summary performance of the boys and girls in the Reasoning Ability Test, the Reading Comprehension Test, and academic performance. The data on the table demonstrates that in academic performance the girls performed better on average than the boys on all the five school subjects considered. Girls also performed better than boys in the Intelligence Test. However, in the Reading Comprehension Test, the boys performed better than the girls.

Table 4.4 Summary performance of boys and girls – Average scores.

	Av.Age	Eng.	GHC	Swa.	Math	Sci./ Agric.	Reading Comp.	Intell.
Boys	15.35yr	46.03	52.86	53.86	46.2	58.23.	55.12	53.32
Girls	15yr	49.06	56.35	56.75	51.25	60.92	52.57	53.58

Graph 4.4 depicts the distribution of scores in the Reasoning Ability Test for the boys and the girls individually. Both boys and girls had an average performance with most of them scoring around the mean. On average, the girls attained higher scores in the Reasoning Ability Test than the boys. The boys had both the lowest and the highest score.

Graph 4.4 Distribution of scores for boys and girls in the reasoning ability test.



4.3.0 Summary of Statistical Findings

The pupils in the study had an average performance in the school subjects tested and as a whole, the girls performance was better than the boys. Similarly, average scores were obtained in the Reasoning Ability test with the girls performing better than the boys. Only in the Reading Comprehension test did the boys perform better than the girls. Performance in this test was also average.

4.4.0 Results of Hypotheses Testing

In this section, results shall be presented regarding the relationships between reading comprehension and the school subjects, intelligence and gender.

These first five hypotheses sought to find out whether a relationship exists between pupils' reading comprehension and their academic performance in English, GHC, Kiswahili, Mathematics, and Science. The following null hypotheses were tested.

H_{01}: At the 0.05 level of significance, there is no significant correlation between reading comprehension and performance in English among standard eight pupils in rural Machakos District

H_{02}: At the 0.05 level of significance, there is no significant correlation between reading comprehension and performance in GHC among standard eight pupils in rural Machakos District.

H_{03}: At the 0.05 level of significance, there is no significant correlation between reading comprehension and performance in Kiswahili among standard eight pupils in rural Machakos District

H_{04}: At the 0.05 level of significance, there is no significant correlation between reading comprehension and performance in Mathematics among standard eight pupils in rural Machakos District

H_{05}: At the 0.05 level of significance, there is no significant correlation between reading comprehension and performance in Science among standard eight pupils in rural Machakos District.

The results obtained after carrying out the Pearson Product Moment Correlation are presented in Table 4.5.

Table 4.5 Correlation between reading comprehension and performance in the school subjects

Subject	Pearson Correlation.	P Value
English	0.5785	0.0000*
GHC	0.3074	0.0008*
Kiswah.ili	0.4687	0.0000*
Mathematics	0.2971	0.0012*
Science	0.3467	0.0001*

* $p < 0.05$

As can be noted from Table 4.5, all the subjects correlated positively and significantly with reading comprehension, with English and Kiswahili having the highest correlation co-efficient and Mathematics with the lowest correlation co-efficient. This suggests a moderate relationship between reading comprehension and English and Kiswahili while there was a low correlation of reading comprehension and Mathematics, GHC and Science. The null hypotheses were rejected, and it was concluded that the performance in the subject areas is related to the pupils' reading comprehension ability for both art and science subjects.

Hypothesis 6

This hypothesis sought to find out whether a relationship existed between reading comprehension and intelligence. The null hypothesis tested was as follows:

H_{06}: At the 0.05 level of significance, there is no significant relationship between reading comprehension and intelligence among standard eight pupils in rural Machakos District.

There was a significant correlation between reading comprehension and intelligence at the 0.05 level of significance, of 0.897 and the null hypothesis was therefore rejected. It was concluded that reading comprehension in English was related to intelligence. This correlation co-efficient was very strong; it was suggesting that performance in the reading comprehension test could to a large extent be predicted by performance in the intelligence test.

Hypothesis 7

This hypothesis sought to find out whether gender had any significant effect on reading comprehension among the students under study.

H_{07}: At the 0.05 level of significance, there is no difference between the performance of boys and girls in reading comprehension among standard eight pupils in rural Machakos District. i.e., $p_1 = p_2$

On carrying out the t- test, the obtained t-value was 1.44 and p was .677. The null hypothesis was accepted. There was no significant difference between boys and girls in reading comprehension in English. To test this hypothesis further, the attained scores of each of the gender groups in academic performance and the intelligence test were correlated with their reading comprehension test scores and the correlations compared. The results are tabulated in Table 4.6.

All the correlations were positive indicating that as reading comprehension ability increases both boys' and girls' performance in all the subjects also increases. In all the subjects apart from GHC, the correlations were higher for boys than for girls. Performance in English had a strong positive correlation with

Table 4.6 Gender differences in the correlation of academic performance and intelligence with reading comprehension.

Academic subjects and reasoning ability	Boys		Girls	
	r value	P value	r value	P value
Math	.3187	.010*	.1870	.189
English	.6083	.000*	.5170	.000*
Kiswahili	.5361	.000*	.3692	.008*
GHC	.2637	.034*	.3559	.010*
Science	.3589	.003*	.2746	.051
Intelligence	.4000	.001*	.4229	.002*

* $p < 0.05$

reading comprehension for boys of 6083 and a moderate correlation for girls of .5170, while the correlation between reading comprehension and performance in Kiswahili was moderate for the boys (.5361) and low for the girls (.3692). The correlation between reading comprehension and intelligence was also positive with girls having a higher correlation value than the boys.

Further, the p-values for each of these correlations were calculated to determine whether the correlations were significant. The results indicate that the correlations of Mathematics and Science with Reading Comprehension for the girls were not significant at the 0.05 level of significance while there was a very high significance in the correlation between both languages, i.e. English and Kiswahili, and Reading Comprehension for both boys and girls. Notable also is the high significance of the correlation between Intelligence and Reading Comprehension for both boys and girls.

4.5.0 Summary

A descriptive and statistical analysis of the relationship among the variables in the study was performed. The variables were reading comprehension, intelligence and academic performance in English, GHC, Kiswahili, Mathematics and Science. The best average performance in the subjects examined was in Science, and the most poorly performed subject was Mathematics. Interestingly though, the Mathematics sub-test in the IDEA had the highest score in all five sub-tests and

pupils scored in this sub-test almost twice as much as they did in the other four sub-tests in which moderate scores were obtained. This could be attributed to the practice effect as the Mathematics sub-test contained arithmetic questions that the pupils are familiar to, as they are similar to those found in the school texts. The other sub-tests may not have been so obvious as they required the pupil to identify the odd item in the group. In the reading comprehension test average scores were obtained.

The correlations between reading comprehension and the five subjects, English, GHC, Kiswahili, Mathematics and Science were positive and significant. It was highest for the languages, i.e., English and Kiswahili and lowest for Mathematics.

The positive correlation obtained between reading comprehension and performance in Mathematics was in agreement with results obtained by Martin (1963) and Linville (1970) who both found a positive relationship between mathematical problem solving and reading. The correlation coefficient is however lower than that of reading comprehension and the other four subjects. This could be due to the nature of the mathematics test, which had more symbolic problems than word problems. The positive correlation at the same time points out the fact that reading comprehension does have a role to play in the performance of mathematics even though mathematics may be regarded as largely symbolic.

GHC, Kiswahili, and Science were also significantly related to reading comprehension. The significance level of the correlation of Science and GHC

with reading comprehension was very high at .0001 and .0008, respectively. These findings of different correlation levels for different school subjects supports the conclusions made by Peters and Kaufman (1975) cited in Anderson and Freebody (1979) that a good comprehender of Social Studies or Science text may not necessarily be a good comprehender of literature and mathematical material.

Notable is that the correlation between performance in GHC and reading comprehension was 0.3074 while the correlation between performance in Science and reading comprehension was 0.3467. Although these correlations are lower than in the languages, they are significant and suggest that reading comprehension is important in the performance of these subjects. Reading comprehension should therefore be emphasised in the teaching of Science, GHC as well as other Social Sciences.

Performance in both languages i.e. English and Kiswahili had a moderate correlation with reading comprehension of 0.5785 and 0.4687 respectively. This suggests that the comprehension processing skills required to comprehend an English passage are similar to those required to comprehend a Kiswahili passage. Further research would be needed to confirm or disconfirm this suggestion.

Concerning intelligence, the study found a strong significant relationship between reading comprehension and intelligence of approximately 0.9. These results tally with results obtained earlier by Stanovich et al. (1980) which reported the correlation between intelligence and various aspects of reading of first, second,

and third grade students as .33, .42, and .56 respectively. His results indicate an increasing correlational value with the increasing ages of the subjects. Cited in his study were results obtained by Andrew (1978), Glossop (1979) and Gutterman (1979) who had correlational values of .71, .82, and .64 respectively. Their subjects were 14 years old and above. It does seem possible therefore, that the correlation between reading comprehension and intelligence increases with increasing age. The strong correlation obtained in this study would suggest that intelligence might be a predictor of reading comprehension ability among the standard eight pupils.

In this study on the surface, gender does not appear to have an effect on pupils' reading comprehension. The study found no statistically significant difference between the performance of boys and that of girls in the reading comprehension test. However, further analysis revealed that the correlation between reading comprehension and academic performance in all the subjects for both boys and girls was significant, apart from the correlation with Mathematics and Science for the girls. This means that an increase in reading comprehension ability does not correspond to increases in performance in Mathematics and Science for the girls. This would seem to suggest some form of gender difference since for the boys, the increase in reading comprehension ability would be associated to increases in performance in Mathematics and Science. In addition, boys obtained higher correlational values than girls in all subjects except GHC. This means that the relationship between reading comprehension and performance is stronger for the

boys than for the girls in all subjects apart from GHC. Further research is therefore necessary to determine the specific effects of gender on reading comprehension.

CHAPTER FIVE

CONCLUSION

5.1.0 Summary of Results

This study sought to find out the relationship between reading comprehension and various school subjects. The correlation between reading comprehension and intelligence and gender differences in reading comprehension were also investigated.

The scores obtained by the pupils in the reading comprehension test were correlated with their academic performance scores and also with their scores in the intelligence test. In addition, the pupils' scores in the reading comprehension test were analysed for gender differences. Further analysis was carried out on possible gender differences in the correlation of reading comprehension with academic performance and intelligence.

The following were the results of the study:

- At $p < 0.05$, there was a significant positive relationship among standard 8 pupils in rural Machakos District between reading comprehension and performance in English ($r = 0.579$).

- At $p < 0.05$, there was a significant positive relationship among standard 8 pupils

in rural Machakos District between reading comprehension and performance in GHC. ($r = 0.307$).

- At $p < 0.05$, there was a significant positive relationship among standard 8 pupils in rural Machakos District between reading comprehension and performance in Kiswahili ($r = 0.469$)
- At $p < 0.05$, there was a significant positive relationship among standard 8 pupils in rural Machakos District between reading comprehension and performance in Mathematics. ($r = 0.297$)
- At $p < 0.05$, there was a significant positive relationship among standard 8 pupils in rural Machakos District between reading comprehension and performance in Science. ($r = 0.346$)
- At $p < 0.05$, there was a significant positive correlation among standard 8 pupils in rural Machakos District between reading comprehension and intelligence
- At $p < 0.05$, there was no significant effect of gender on reading comprehension among standard 8 pupils in rural Machakos District.
- The correlation between reading comprehension and performance in all the subjects was not significantly different for boys as compared to the girls.
- At $p<0.05$, the correlation between reading comprehension and performance in Mathematics and Science was not significant for the girls.

5.2.0 Implications of the Results

Firstly, in reference to academic performance, the development of reading comprehension skills needs to be emphasised. Even in the practically oriented subjects, there is a need for the students to understand the instructions and the text materials. Students need to be familiar with the vocabulary used in each the various subject areas. Tuition for slow learners in the classroom should therefore first seek to assess and enhance the reading comprehension skills of the students. Only then can a teacher be sure that the student has the ability to comprehend the text and can then move on to learning the various concepts of the subject in question.

Various methods should be used in the teaching of various subjects so as to ensure that the pupils have comprehended the material taught. Recent research in the area of Science instruction has found that reading and listening to lectures are, for most students, ineffective ways of changing the way the student first grasps a scientific concept or their mental model of the concept. This mental model will influence their understanding of scientific facts and performance in the Science subject (Redish, 1998). Teachers should therefore seek to employ the methods that best enhance comprehension in the subject area, especially methods that allow for discussion and application of facts taught so that the teacher is able to assess how the pupils have understood the text. As observed by Redish, success in reading which is tested by oral performance or simple recall of content read, may

not necessarily mean success in the Science subject, especially where the question calls for application of the facts taught.

Further, the teaching of reading comprehension as a school subject should be emphasised. This should be done right from the lower grades of primary education so that the pupils would have well developed comprehension skills by the time they are inn upper primary and preparing for their final primary school examinations.

Those preparing school texts for use by the pupils should ensure that the pupils for whom it is intended are able to comprehend the language used in the texts. This can be achieved through testing for the readability of the text. It would help alleviate the academic performance of the pupils.

The Kenya National Examination Council and other examination bodies should ensure that the teachers assigned to teach the pupils have well developed comprehension skills. These are the teachers who will not only teach the pupils but will also set examinations for the same pupils. They should be competent language users and be fully aware of the skills that they need develop in the pupils so that they too gain competence in language use. Reading comprehension should therefore be emphasised in the teacher-training course.

Some students are of low intelligence and might be to some extent disadvantaged in as far as reading comprehension is concerned. These students

might therefore benefit less from programmed instruction where they need to read and understand text and make the relevant applications. This is the case when students are assigned some text to read and then answer some questions, with no further explanations from the teacher. On the contrary, teachers would need to spend more time with the pupils of low intelligence guiding them through the text and any written instructions. This is being done among the severely retarded learners who are assigned to special schools. However there are many slow learners in the conventional schools who unfortunately receive no special teaching attention and will always lag behind in class. It may therefore be necessary to assess the intelligence levels and reading comprehension ability of the students as a guide to what kind of instruction would be beneficial to them. This may be best achieved through individual testing and diagnosis.

No discrimination with regard to gender should be made in the classroom in the higher classes as concerns reading. Both boys and girls are able to benefit from reading. However, further investigation should be carried out to determine the different aspects of reading that each gender group is able to benefit the most from.

5.3.0 Research Recommendations

5.3.1 Curriculum

In the review of the 8-4-4 education system, it is recommended that the teaching of reading comprehension skills be included in the various academic syllabi. This would include teaching comprehension skills in all subject areas to ensure that the pupil is well equipped to understand the material presented to him. It should also provide for regular assessment of the pupils reading comprehension skills so that remedial action can be taken when necessary.

In the writing of school texts, it is important that the text is written at the average reading level of the pupils for whom it is intended. This will ensure that they understand the written material. However, an issue that needs to be addressed is the fact that both rural and urban pupils use the same course books yet the rural pupils have less exposure to the English language and are likely to have lower comprehension abilities. Strategies should be adapted to improve the reading comprehension skills of the rural pupils so that they are not disadvantaged when they use the same reading material as the urban pupils who have more exposure to English language.

5.3.2 Teaching

More innovative approaches need to be incorporated in the teaching of the various school subjects. These should be methods that ensure that the teacher is

able to monitor the comprehension of the pupils.

To enhance the comprehension of material read in Science subjects, it is recommended that the approach in teaching these subjects be more pupil oriented than teacher oriented. Sutman, (1993) recommends the use of inquiry/discovery instruction as opposed to lecture/discussion in Science instruction. In inquiry/discovery instruction, the students have the opportunity to find the answers to the questions they themselves pose about a topic. They develop their English language skills as they articulate the problems they have devised and their efforts to solve them, and they learn to learn on their own.

In the lecture/discussion method of instruction teachers tell the students what they are to learn, and then ask them to answer questions about what they have heard, frequently providing the answers themselves if the students do not respond fast enough. This approach limits the learning experience for all the students, for it gives them very little opportunity to discuss issues, solve problems, or ask their own questions, and thus, to develop thinking skills. It is even less effective for Low English Proficiency students since it is more dependent on students' understanding of what the teacher says, and it provides fewer occasions for individual students to speak, and thus, limits their practice of their English skills.

It is therefore of greater importance that tutors in primary teacher training colleges ensure that their students who will be future teachers, are well equipped in comprehension skills and are able to teach comprehension skills and assess the

comprehension ability of their pupils in their various subject areas. The future teachers should therefore themselves be able to read and comprehend text accurately.

5.3.3 Examinations

Test constructors should test the test items for readabilty to ensure that the items are written to the reading levels of the pupils. Except in English language tests, the test constructor should ensure that the items test mainly for mastery in the subject area. The test items should be comprehensible in English. This will avoid poor performance that is due to the use of language that is above the reading level of the pupils. Mwangi (1991) observed this too. Teachers in her study concurred that the language of examination for primary school pupils was no match for the low English skills of the pupils.

In preparing the pupils to take examinations, teachers should train the pupils in the various comprehension skills required for the pupil to understand the questions and present his answer in a meaningful manner. This will ensure that the pupils' performance is not adversely affected by their inability to understand the questions.

5.3.4 Research

A more extensive study should be carried out that will consider the various components of reading comprehension and see how each of these contribute to academic achievement for both boys and girls. To show more clearly that reading comprehension has an effect on academic achievement, an experiment should be conducted whereby a group of students is trained in reading comprehension skills and their academic achievement compared to students who have received no training at all. In addition, the reading comprehension skills should be broken down to various components so as to ascertain the effect of each on academic achievement.

A further study should investigate the different methods of teaching reading comprehension and their effect on pupils of various ages, intelligence, and socio-economic status. This would give a guide on the most effective ways of teaching reading comprehension skills to our Kenyan pupils whose language background is different from their European or American counterparts.

Research is also necessary to assess the comprehension monitoring skills of pupils as they learn various subjects. This would give insight to methods that can be employed in the teaching of these subjects to ensure comprehension.

The relationship between intelligence and reading comprehension should be further investigated. Various components of reading should be assessed with

regard to their relationship to intelligence. This would shed further light on ways in which slow learners can be assisted and also whether intelligence can be used to predict reading comprehension among pupils

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Appendix A

Cloze Passage: "A Visit to the Hospital"

Gobi had every reason to be happy in April last year. The school holidays had just begun, and he could _____ his time playing with friends from other schools. _____ was also waiting anxiously for the day when his _____ brother, who worked in a local hospital would take _____on a visit there. As a young boy Gobi _____ often said he wanted to become a doctor. The _____ to the hospital would help him make a _____.

At last the day came, and Gobi set off _____ on the visit. His brother took him first to _____ out-patients section. Most patients, Gobi learned, were received at _____ hospital here. Then they might be referred to other _____. Some might be sent to the operating theatre for _____, while others could be seen by physicians and given _____ attention. Patients came with all sorts of complaints and _____. Some complained of severe pains in the stomach. Many _____ them were quickly treated and discharged.

A mother complained _____ her child had diarrhoea and vomiting. The doctor told _____ that diarrhoea could be serious. If the child was _____ treated quickly, it could die from loss of liquid. _____, the doctor prescribed some medicine for the baby. He _____ instructions about how many teaspoonfuls the child was to _____ each day. The mother was further advised to stir _____ medicine well before use and replace the cork _____ in the bottle.

(Source: Curtis et al. (1987) Four Skills English: A primary course standard 6.pp.151)

Appendix B

Maze Passage: "A Visit to the Hospital"

Gobi had every reason to be happy in April last year. The school holidays had ju
begun, and he could [make, spend, quickly] his time playing with friends fro
other schools. [He, She, His] was also waiting anxiously for the day when h
[elder, larger, boy] brother, who worked in a local hospital would take [her, Gob
him] on a visit there. As a young boy Gobi [thought, is, had] often said he wante
to become a doctor. The [visit, journey, big] to the hospital would help him mal
a [brother, decision, story].

At last the day came, and Gobi set off [sadly, happily, there] on the visit. H
brother took him first to [the, a, hospital] out-patients section. Most patients, Go
learned, were received at [many, a, the] hospital here. Then they might be referr
to other [sick, house, departments]. Some might be sent to the operating theat
for [talking, surgery, medicine], while others could be seen by physicians a
given [medical, school, vomiting] attention. Patients came with all sorts
complaints and [joys, sick, diseases]. Some complained of severe pains in t
stomach. Many [of, and, patients] them were quickly treated and discharged.

A mother complained [that, of, crying] her child had diarrhoea and vomiting. T
doctor told [mother, her, him] that diarrhoea could be serious. If the child w
[crying, even, not] treated quickly, it could die from loss of liquid. [He, howeve
and], the doctor prescribed some medicine for the baby. He [gave, listene
writing] instructions about how many teaspoonfuls the child was to [treated, giv
take] each day. The mother was further advised to stir [spoon, a, the] medici
well before use and replace the cork [medicine, tightly, carelessly] in the bottle.

Appendix C

Cloze Passage: "Moses in Trouble"

(This story is told by Musa, a pupil in a Uganda secondary school called Mukibi's Educational Institute for the Sons of African Gentlemen. His nickname in the school is Holy Moses, or Moses for short. All the Kitchen staff have gone on strike for higher wages. So the headmaster has said that each dormitory in turn must provide food for the whole school for a week. When it is the turn of Moses' dormitory, Dorm 3, they find it difficult to get any food at all. Moses discusses the problem one evening with his friends Rukia, Mutagubya and Sebastian Mulutu, who likes to be known as King Kong. By a series of accidents Moses has missed his supper.)

"I'm starving," I said bitterly, " I'll drop dead if _____ don't eat something soon."

"All right." Rukia got to his feet. "This afternoon _____talked of borrowing milk. Well, no matter what King Kong _____, I think it's a good idea and I'm ready _____ go borrowing milk now from the farm next door. _____ come with me and then you can have _____ drink of it, and that should keep you going _____ breakfast time." "I think you're both crazy," King Kong remarked, "_____ I'll come too and be look-out."

Mutagubya also said _____would join us, and then everybody else wanted to _____. However, I suddenly had another idea. While Rukia, King Kong, _____ and I were collecting the milk, the rest of _____ boys in our dorm could cut some of the sugarcane _____ grew wild all round the school and _____ boil it with breakfast tea in place of _____ sugar. We all left the dormitory, and we who _____going on the milking expedition took with us _____ four gallon can which normally held our washing water.

"Heavens, _____ smells bad!" complained King Kong, wrinkling his nose,

"So _____ you if you held stagnant water for as long _____ that can does," Rukia replied.

"Well, I don't like _____ idea of putting milk in it," King Kong said. Nor _____ I; but there was no other container available.
We _____ reached the field where we had earlier seen the _____.

(Source: Arnold Curtis (1987) Four Skills English: A primary course standard 7. pp78-79)

Appendix D

Maze Passage: "Moses in Trouble"

(This story is told by Musa, a pupil in a Uganda secondary school called Mukibi's Educational Institute for the Sons of African Gentlemen. His nickname in the school is Holy Moses, or Moses for short. All the Kitchen staff have gone on strike for higher wages. So the headmaster has said that each dormitory in turn must provide food for the whole school for a week. When it is the turn of Moses' dormitory, Dorm 3, they find it difficult to get any food at all. Moses discusses the problem one evening with his friends Rukia, Mutagubya and Sebastian Mulutu, who likes to be known as King Kong. By a series of accidents Moses has missed his supper.)

"I'm starving," I said bitterly, " I'll drop dead if I don't eat something soon."

"All right." Rukia got to his feet. "This afternoon [hot, it, you] talked of borrowing milk. Well, no matter what King Kong [says, cries, hungry], I think it's a good idea and I'm ready [to, we, brave] go borrowing milk now from the farm next door. [Me, You, Eat] come with me and then you can have [cup, good, a] drink of it, and that should keep you going [bed, because, until] breakfast time." "I think you're both crazy," King Kong remarked, "[Rukia, since, but] I'll come too and be look-out."

Mutagubya also said [he, she, happy] would join us, and then everybody else wanted to [drinking, come, climb]. However, I suddenly had another idea. While Rukia, King Kong, [Mutagubya, Rukia, milking] and I were collecting the milk, the rest of [we, the, school] boys in our dorm could cut some of the sugarcane [sweet, that, and] grew wild all round the school and [she, we, so] boil it with breakfast tea in place of [those, wonderful, ordinary] sugar.

We all left the dormitory, and we who [were, did, running] going on the milking expedition took with us [carry, the, it] four gallon can which normally held our washing water.

"Heavens, [that, it, noisy] smells bad!" complained King Kong, wrinkling his nose,

"So [what, did, would] you if you held stagnant water for as long [as, for, done] that can does," Rukia replied.

"Well, I don't like [such, the, a] idea of putting milk in it," King Kong said. Nor [did, does, smell] I; but there was no other container available.

We [soon, first, tired] reached the field where we had earlier seen the [cows, grass, milking].

Appendix E

Cloze Passage: "Wildlife"

The wild animals of Kenya are part of our country's wealth. In many countries wildlife has almost disappeared. Most of the animals have been hunted and killed _____ make more room for farming. But in Kenya _____ thousands of them survive and continue to live in our _____ parks.

Why do we want to keep our wildlife? _____ should we not kill the animals and make _____ more land on which to keep cattle and plant _____ harvest crops?

The chief reason is that animals _____ beautiful creatures who enjoy their lives as much as _____ do. They are part of our environment that we _____ not want to destroy. The world would be a _____ poorer place without them.

Another important reason is that, _____wild animals are rare in so many parts of _____ world, people in other countries want to come and _____ them, just as we do ourselves. Visitors to Kenya _____ the old days used to come with the idea _____ hunting. Nowadays hunting game is forbidden, and what people _____ is to watch the game and photograph it. They _____ with them not guns but cameras.

Several hundred thousand _____ come to Kenya every year, and the money they _____ for their holidays is an important part of the _____ income. In fact tourism has become our second most _____ industry. It earns more money for Kenya than any _____ industry except agriculture.

(Source: Arnold Curtis(1987) Four Skills English: A primary course standard 7. pp18)

Appendix F

Maze Passage: "Wildlife"

The wild animals of Kenya are part of our country's wealth. In many countries wildlife has almost disappeared. Most of the animals have been hunted and killed [so, to, they] make more room for farming. But in Kenya [many, and, great] thousands of them survive and continue to live in our [National, show, happy] parks.

Why do we want to keep our wildlife? [Children, How, Why] should we not kill the animals and make [available, away, those] more land on which to keep cattle and plant [trees, some, no] harvest crops?

The chief reason is that animals [are, were, zebras] beautiful creatures who enjoy their lives as much as [we, I, dog] do. They are part of our environment that we [people, do, did] not want to destroy. The world would be a [much, most, different] poorer place without them.

Another important reason is that, [because, therefore, beautiful] wild animals are rare in so many parts of [happy, a, the] world, people in other countries want to come and [animal, taste, see] them, just as we do ourselves. Visitors to Kenya [good, in, for] the old days used to come with the idea [of, and, gladly] hunting. Nowadays hunting game is forbidden, and what people [driving, want, see] is to watch the game and photograph it. They [come, bring, shoot] with them not guns but cameras.

Several hundred thousand [beautiful, visitors, animals] come to Kenya every year, and the money they [spend, buy, selling] for their holidays is an important part of the [animal's, rich, country's] income. In fact tourism has become our second most [and, good, important] industry. It earns more money for Kenya than any [wildlife, other, else] industry except agriculture.