AN EVALUATION OF THE READABILITY OF CLASS TWO AND FIVE KENYAN PRIMARY SCHOOL ENGLISH COURSE BOOKS.

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".

BEATRICE AKOTH OKOTH

"I confirm that the work reported in this thesis was carried out by the candidate under my/our supervision"

Mr. C. Gecaga

Dr. L. Vikiru
DEDICATION

This work is dedicated to my late parents, Mary and Joram Okoth, from whom I have learnt the value of hard work and to my loving husband Bob and little baby "Papa". Thank you for your patience.
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ABBREVIATIONS

S.L: Second Language
E.S.L: English as a second language
E.F.L: English as a foreign language
D.C.T: Dual Coding Theory
PIAT: Peabody Achievement Test
K: Kindergarten
DEFINITION OF TERMS

Cloze procedure:

A procedure, which involves deleting or omitting words in a written text on a systematic basis. The reader is required to insert appropriate words with the help of the context. Cloze procedures can be used to measure reading attainment and the level of difficulty of any given book.

Legibility:

Refers to visual perception of letter shapes, isolated words and words in context and those factors of type construction and setting, which affect the ability to identify letters and words and therefore, fluency.

Readability:

It is the sum total (including interactions) of all those elements within a given piece of printed material that affects the success a group of readers has with it. The success is the extent to which they understand it, read it at optimum speed and find it interesting.
Readability formula:

A mathematical tool that uses counts of language variables (for example length, frequency of difficult words, estimates of semantic complexity e.t.c) to provide an index of difficulty for readers. Adapted from Klare in (Chapman and Czerniewoska 1978:2480)

Reading age:

The age at which a reader is expected to comprehend reading deemed appropriate for a particular age.

Reading grade level:

Material is said to have a certain reading grade level if readers of that school grade can comprehend it.

Text:

The main body of a book; the actual wording of anything written or printed; the author’s words.

Textbook/course book:

A book used for instructions.
ABSTRACT

There is a strong belief that Kenyans at all levels lack a reading culture and only read on purpose. This is believed to have contributed to the decline in the proficient use of English language. We have not had access to a study conducted on the nature and extent of the above claims but claims of the declining standards have produced evidence, mostly anecdotal, to show that learner language is poorer particularly with regard to observance of basic rules of grammar in basic productive skills of speaking and writing.

The media, book publishing firms and public libraries decry poor reading culture by the public. Popular discourse by the media and language pedagogy circles have located the falling standards at the feet of other linguistic influences (e.g. first language, sheng- the urban youth code) and the influence of teacher language and the language of other models.

This paper sets out to restate that poor reading culture and the falling standards in the proficiency of English can be addressed by looking at textbooks, particularly course books. The course books represent to both the teacher and the student the visible heart of any ELT program. For this matter, the readability of these books in terms of comprehensibility, interest and legibility is crucial if they are to promote not only proficiency but also the culture of reading.
Evaluation of the readability of a course book should not only be at the core of every course book evaluation and selection process but should be an elaborate and holistic process that looks into the appropriateness of linguistic and non-linguistic correlates of the text. This is because the process signals an executive educational decision in which there is considerable professional and even political investment. This paper, will therefore, assess the readability of class two and five English course books.
CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the problem

Attainment of literacy is directly related to academic, economic, social, political, and personal life and values (Harris, 1990). As far back as 1935, Gates described reading as the most important and troublesome subject in primary schools. Since mastering reading is essential to learning almost every other school subject, failure in the primary school is directly related to deficiencies in reading. Along the same line, Ogle, Absalam and Rogers (1991) reported that students who have difficulty in reading are more likely to experience unemployment upon leaving school. Reading is a vital development task that should be mastered.

Unfortunately, there have been mounting complaints regarding poor reading culture among Kenyans (East African Standard, Saturday, June 16, 2001; Sunday Standard, July 7 2002) and a general dissatisfaction with the performance of school leavers in the area of reading. Nyamasyo (1992) and Kirigia (1996) both observed that there was a poor reading ability among Kenyans. Many factors may have contributed to this poor reading culture. For example, methods used to teach reading (Mberia, 2002), inadequate training of teachers and lack of books or the readability of books. While most of the above problems have been investigated, no study so far has looked into the readability of school textbooks as a possible cause of reading difficulty. This study
sought to investigate the role that readability of books plays in contributing to poor reading culture.

In Kenya school textbooks are written by individuals, groups and publishing firms,. The textbooks are then submitted to Kenya Institute of Education (K.I.E) which vets and selects the books through its subject panels. These panels are composed of a panel chair, subject specialist, secretary, teacher trainer and three practising subject specialists.

The panel uses various methods of evaluation such as material presentation and syllabus recommendations to vet the books. Normally, for each subject one book is chosen as the main course book. Then quite a number of books up to 50 are enlisted as supplementary books. These are then sent to schools through the Ministry of Education as lists of approved books. Schools and other stakeholders are expected to use the core book plus any other they may deem fit from the list of approved books. Nevertheless, schools are given the freedom to choose any other suitable book from outside this list.

This study while using the classical readability formulas, and while informed by the Schema Theory and the Dual Coding Theory followed up on what K.I.E does. This was by finding out the readability of class 2 and 5 English course books in the approved list and also found out the teachers' opinions on the readability of these books.
This was especially significant since most teachers acknowledge not knowing how to evaluate the readability of materials (Mberia, 2002). In addition, the whole business of product Assessment by publishing firms is haphazard and generally under researched (Sheldon, 1988). They therefore, cannot be wholly relied upon to make accurate recommendations on the suitability of their products.

1.2 Statement of the problem

The study sought to evaluate the readability of class two and class five English course books. This was done by looking at the complexity of words and sentences in relation to reading ability of the reader, the legibility of print and of any illustrations, and the levels of interest of these books. Local studies so far have looked into readability of textbooks using readability formulas only. However, the study used readability formulas and also assessed the legibility of class two and class five English course books. In addition, the appropriateness of illustrations was also investigated. All these were to establish the readability of these books.

1.3 Research Questions

The study was guided by the following questions:

i. What are the reading grade levels of class two and five English course books?

ii. Are the books legible enough to enhance the speed of reading and efficiency of comprehension?

iii. Are the books interesting enough for learners at the recommended levels?
iv. What are teachers' opinions on the readability of the class two and five English course books?

1.4 Objectives of the Study

The objectives were:

i. To assess the reading grade levels of class two and five English course books used in Kenya.

ii. To assess the legibility of the print (font type, size) organization of the text, reading conditions and illustrations.

iii. To establish the levels of interest of these books.

iv. To find out teachers' opinions on the readability of the above books.

1.5 Research Assumptions

i. Reading material tallies with a particular grade level.

ii. The legibility of the print enhances the learners reading ability.

iii. The content of the book determines its level of interest.

iv. That teachers have opinions on comprehensibility, interest and legibility of books.

1.6 Scope and Limitations

Readability is the concept of a whole complex of relationships between the reader and the written text. Dale and Chall (1948) observe that readability involves (1) ease of reading (ii) interest or compellingness and (iii) ease of understanding. Most researchers have regarded these three aspects as alternatives and as result each measure devised reflects only one of them.
It is significant to see what is being measured in each case. Firstly, ease of reading has come to be measured by use of word recognition speed, error rates, number of eye fixations per second, all of which relate to primary skills and are measures of visibility or legibility. The study did not only carry out an experiment on legibility but also used a checklist constructed from the results of a research that had studied the effects of typeface and font size on legibility for children. The organization of the texts, reading conditions and illustrations was also studied.

Secondly, when defined as interest or compellingness, readability has been measured by reference to human interest, density of ideas and aesthetic judgment of style. Here individual interest that motivates learners was not looked into. However, Flesch Human-Interest formula was used for purposes of objectivity.

Thirdly, when readability is defined as ease of understanding or comprehension, measures have referred to characteristics of words and sentences, such as their length or frequency of occurrence in the case of the former and complexity in the case of the latter. This study focused on this by using Flesch Reading Ease Formula and Power-Summer- Kearl Formula and the Spache formula. These formulas are explained in the methodology section.

There are other factors that influence readability such as interest and motivation, purpose, maturity and intelligence of individual readers. These factors were not looked into due to limited time and theoretical focus.
1.7 Rationale of the Study

Readability in its broadest sense is a matching of readers and written texts. Viewed in this context, it therefore acquires great significance in the education process. Readability studies serve both short term and long-term purposes.

1.7.1 Short-term Purposes

Readability studies of English Course books should be of immediate concern to: English teachers; school and teacher training college librarians; parents and all those concerned with education of children.

The groups above play a critical role in the selection and organization of learning materials and resource for school children. Teachers in particular are faced with bewildering flood of printed materials differing widely in content, difficulty and style. The teacher has to make a choice from all these materials. Generally he is also faced with frequent changes in the syllabus, at times, not accompanied with proper advice on the choice of material to cover the new syllabus. A teacher who has the basic tools and skills for evaluating readability of classroom material will find the task of selection and assessment of reading materials much easier.

It is hoped that this study will arouse the interest of a large number of teachers who are concerned with the quality of reading materials and has spurred them into doing something about such materials. Gulliland (1972:15) observes that a further advantage to the teacher lies in the possibility of adopting some methods of studying readability for
use as teaching techniques, thus enabling children to improve their skill in reading and comprehension.

Librarians are involved in the selection and organization of reading materials. An understanding and appreciation of the need to match books with readers will help them organize the holdings of their libraries. The role of the parent cannot be overemphasized. There are a number of schools that give parents some latitude in deciding what the pupils will read. Readability awareness will assist such parents to make appropriate selections.

1.7.2 Long Term Purposes

Eventually, the burden of providing readable materials will fall on writers of textbooks and publishers of educational materials. Textbook writers have to communicate facts, theories, impressions, values and attitudes. In order to do this effectively, they must have some idea on the reading ability of their intended audience, and in particular they must know how sentence construction and arrangement of ideas influence understanding. Readability studies provide authors with efficient and easy methods of appraising the suitability of their written work.

In Kenya, according to the Procedures, Methodology Criteria and Marking Scheme For Evaluation and Approval of Textbook For Schools in Kenya dated June 10, 2002 book evaluation panels are set by KIE and the director of education to guard against conflict of interest. Each has seven members comprising a panel chair, subject specialist, secretary, teacher trainer and three practising subject specialists. Their work is to
evaluate already published books. Therefore the knowledge of readability measurement can assist the overall evaluation.
CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0. Literature review

The study drew from four relevant bodies of literature related to the process of reading and readability. The first is the long-standing empirical tradition of estimating the readability of texts by examining their linguistic characteristics; the second is the influence of illustration in children's books and the third is the effects of typeface and font size on legibility for children. Finally, the study looked into the schema theory of reading and the cognitive information processing view of reading as seen in dual coding theory.

2.1 History of measuring text difficulty

According to Klare (1985), readability concerns itself with qualities of writing, which are related to readers' comprehension. Readability formulas refer to a predictive device intended to provide quantitative and objective estimates of reading difficulty (Klare, 1963). Readability formulas have been used as an indicator of comprehension difficulty of reading materials.

Readability has been studied in two traditions: prediction and production. In the prediction tradition, readability of a text has been investigated to predict how readable a piece of writing is likely to be for the intended reader or to predict the grade level of the written materials. In the production tradition, readability of a text has been manipulated experimentally to produce readable texts for readers in a target population. Applying psychometric theory, prediction research has been done and the validity and reliability
found to be high compared to production research studies. The prediction research studies can be generalizable because a large sample size of the criterion variable is used. However, production research studies, which are done in the psycholinguistic tradition, have comparatively low reliability, which influences their reliability and validity.

According to Klares’ (1963,1974-5,1984) historical accounts of readability measurement, the development of readability formulas goes back to the early 1920’s. H.D.Ketson can be considered as its pioneer. He used a number of syllables in a word and the number of words in a sentence as indices of the relative difficulty of newspapers and magazines. Since then numerous readability formulas using linear regression have been developed e.g. Lodges (1939) formula used semantic and syntactic factors which are still the most widely used variables.

Flesh’s (1943) formula was designed for adult material. It puts emphasis on abstract words. Using magazine articles as criterion variables he found that counting abstract and affix morphemes as a means of measuring abstractness was closely related to the magazine levels. However, the tediousness of counting affixes and the often-misleading method of counting personal references led to the development of the now popular Flesch Reading Ease Formula and the Flesch Human Interest Formula. The Human-Interest Formula uses personal words per 100 words and personal sentences per 100 sentences. Personal words means using personal names instead of using proper nouns. To counter some deficiencies found in Flesch’s original formula, Dale and Chall (1948) used familiar words to determine semantic difficulty using Dales list of 3000 words and, sentence length (in words) in their formula. Dale, Chall formula is highly
predictive of text difficulty. Most formula developers used children’s material in developing their formulas. This has raised validity issues (Klare1975). Most of these formulas yielded grade-level scales. For example the Fog index developed by Gunning, the Stenners lexile scale and Fry’s readability graph.

There are several authors who have measured text difficulties without relying on readability formulas. Some of the methods they have used are clinical approaches, tests and cloze procedures. The clinical or individual approach was also frequently used as a means of measuring readability (Klare, 1963). For example, Dewey (1931) interviewed children to understand the nature and limitations of comprehension in reading history. However, due to subjective judgment that it is prone to, the clinical approach is often used together with a readability formula in measuring text difficulties.

Tests are also used to measure text difficulty. However, constructing and administering a test is a difficult and time consuming process compared to predicting readability. Taylor (1953) developed the cloze procedure, which requires students to fill in blanks of a text that appear after every few words, usually five words. Klare (1963) criticized the cloze procedure pointing out that it is not a formula. However, it is a quick and easy testing technique that may be used for developing criteria in the construction and validation of readability formulas. Unlike traditional readability formulas, which do not require testing of human subjects to provide readability scores for passages, the cloze procedure does take into account the reader factor (Klare1984).
Carver (1977-78) criticized the cloze test because the cloze difficulty estimate depends on the ability level of the particular group to whom the test was administered as well as the difficulty level of the material. "Even when an ability adjustment for cloze was developed, it was still an impractical method in many situations because it was always necessary to have a norm group before a language difficulty estimate was obtained" (Carver, 1977-78)

The most comprehensive exploration of variables was completed by Bormuth (1966). Using correlation and regression, Bormuth (1966) explored more than 100 structural variables. Among them (60) variables were significant in predicting comprehension difficulty of a critical variable, which was measured by the cloze test. According to Pearson, (1969), Bormuth's contribution in the area of readability was significant in that he was able to estimate readability using multiple regression at the level of word (R = 0.51), the independent clause (R = 0.67), the sentence (R = 0.68) and the passage (R = 0.93) whereas traditional formulas cannot be reliably applied to below passage level. In addition to this, Bormuth's explanation of the parts of speech ratio significantly predicted text difficulty. For example, he found highly explanatory linguistic ratios such as pronoun/conjunction (r=0.81), interjection/pronoun (r=0.62) and verb/conjunction (r=0.73). He also used quadratic terms in his regression model and showed the existence of a non-linear relationship between outcome variables and a predictor. In his study Bormuth also applied Yngves (1960) word depth analysis as a means of measuring sentence complexity. According to Yngves the notion of word depth comes from mechanical translation of language by electronic computers. Embedded sentences such as "the cat that the dog chased was gray" require more memory
because the machine has to store information from the beginning of the sentence (the cat) up to the end of the sentence (was gray).

As was seen in many readability formulas, text difficulties have been measured by semantic factors; vocabulary difficulty was one of the most significant predictors of text difficulties (Davis, 1972; Chall, 1983). As a measure of syntactic difficulties, sentence length or word length has been frequently used. However, short sentences do not necessarily make a text easy to comprehend. (Klare 1963; Kintsch, 1979). Besides this, using factors other than semantic and syntactic was not successful in predicting text difficulty. A recent study by Stenner (1997) using the PIAT reading comprehension test showed that the combination of sentence length and word frequency (the log of mean sentence length) and word frequency (the mean of the log word frequency) explained 85% of the variance in the PIAT item rank order difficulty.

However, Steners study did not incorporate the effect of word order or syntax which has been shown to operate somewhat independently of sentence length (e.g. Pearson, 1974-1975) Notice also that there are some sentences in which sentence length cannot be a genuine explanatory factor: if we were to jamble the order of words in a sentence, it would be difficult or even incomprehensible even though sentence length had not changed at all.

Readability formulas have been criticized for lacking strong theoretical perspectives (Kintsch, 1979) and as such formulas have been based on apparent, or surface level text characteristics. For example, Bormuth’s (1964/66) exploration of more than 60
variables, which contributed to the variance of the criterion variable, using the cloze test, was not based on a consistent reading theory, although some of these variables seemed reasonable and plausible.

Another weakness of the readability formulas is that most of them have not taken the readers ability into account. The traditional readability model regards the process of reading as a passive activity, in which the reader decodes the text to obtain meaning. Therefore, reading can be defined in terms of the skills necessary to decode words and sentences. Because reading is viewed as decoding words and sentences, the difficulty of the text is indexed in terms of word (lexical features) and sentence characteristics.

If literacy is determined by the readers’ ability as well as the difficulty of the text (Bormuth, 1966), then the earlier formulas are problematic because they do not take into account the reader factor (Kintsch & Vipond, 1979). Consequently, they do not measure all the factors that influence the comprehensibility of a text. Since existing formulas have measured only one aspect of writing, the difficulty of style, they have not touched on content, organization, word order, format or imaging of writing nor have they embraced readers factors such as maturity, purpose or intelligence. These formulas do not also take into consideration motivational, situational or typographical factors.

The comments above should not be interpreted as complete rejection of readability formulas. Readability, the relative difficulty of decoding the words, according to Sandra Smith (2002) – is only one of the 22 factors known to make written information more or less easily understood for readers at all skill levels. When materials exceed the reading
skills of intended learners other factors in comprehension become largely irrelevant. That makes readability testing a good first step in evaluating reading materials. A key to selecting the best formula is to understand that each is designed to evaluate a certain type of material for a particular set of readers. For this study, the Flesch reading ease formula, the Flesch human-interest formula, the Powers-Sumner - Kearl formula and the Spache formula were used. These formulas have been chosen because they have been widely used to measure readability especially at Primary levels.

2.1.1 The art of writing readable cases: Flesch's Human Interest.

Writing for primary school children is not the same as writing for insurance agents. The problems are different. Here's Flesch's version of Aristotle pointing out the difference between the young and the old.

Young people like romance, adventure and daydreams, and old people like practical down to earth, Bread- and- butter stuff... So when want to convey information to the young take a hint and make it a story with happy ending.

(As quoted by Clyde, H., 2002; 288)

Flesch argues that if you don’t use examples, dashes of colour and “a good assortment of useless information” the reader won’t remember the facts.

For a writing to be readable, Flesch argues that it must have a point of view. It must have a hero who undergoes trials and tribulations. The hero must have a name. In cases where the theme is serious the name should not be cute. For instance don’t call the physician treating a case of lung cancer Doctor Cough. This trivializes the case and reduces it to a little more than a joke. The best heroes are the ones, which the reader
can identify with. They can be people or animals. Personalization can also be extended to body parts e.g. "I am Juma's heart"

Virtually any writings can be turned into a dialogue. Flesch argues that for a writer to interest his/her readers he must not only turn most of his material into a narrative but he must go a step further and turn a large part of it into dialogue. The percentage of dialogue varies enormously in different kinds of writing. In technical papers it's 0% while in popular magazines and articles it will be between 12% and 15% and can reach 50%.

Flesch advises that for writings to be interesting, short sentences about 18 words should be used. They are easy to read and comprehend. A word of caution is, however, necessary. Too many short sentences in a row gives a jerky staccato flavor and breathless quality and can get irritating if it goes too long. Use of complex sentences every now and again is necessary.

Great beginnings and strong endings are also necessary. "Happy families are all alike; every unhappy family is unhappy in it's own way" is a brilliant opening of Tolstoy's Anna Karenina. Such openings are "grabbers" and readers would want to read more.

Mystery writer, Edward D Hoch says that the ideal opening will do three things: grab the reader, introduce a character and establish a setting. For the ending, they say it should be interesting and worth thinking about, if not dramatic otherwise who cares.
Flesch also advises that writers should avoid heavy sounding words. He gives a list of some of his favorite "Too heavy" prepositions and conjunctions along with simple alternatives. Here are a few:

- Along the lines of = like
- For the reason that = since, because
- In as much as = for, because
- With the result that = so that

Here are a few too heavy connectives that he advises the writers to avoid; accordingly, consequently, hence, and thus. All these can be replaced by the tiny word so. Moreover and nevertheless should be replaced by now and but. These changes he says lighten up the writing and make it enjoyable.

Flesch then shows how a piece of writing can be evaluated by two scores, 'Reading Ease score' and a 'Human Interest score'. The Human-Interest score is calculated using the number of 'personal words' and the number of 'personal sentences'. The Human Interest score ranges from 0 (No human interest) and 100 (full of human interest). Scientific journals score numbers suggesting that they are downright 'dull'. The Readers Digest ranks about 40 as 'interesting' and novels can approach 100 and are 'dramatic'. (Clyde H., 2002: 288-291). This study evaluated stories in selected class 2 and 5 English Course books for their levels of interest using the human-interest formula.
2.2 Reading development

Chall (1983) categorized six developmental stages, from 0 to stage 5, which characterize prototypical reading development. According to Chall, stage 0 is a pre-reading stage covering birth to age 6. At this stage a child gains some insight into the nature of words before going to school. Stage 1 is an actual decoding stage covering grades 1-2 (6-7 years old). A child associates arbitrary letters that they learn with the corresponding parts of spoken words.

Stage 2 covers grades 2-3 (7-8 years old). At this stage, the child reads not for gaining new information but for confirming what is already known. Children pay attention to printed words, usually the most common and high frequency words. Stage 3 reading is characterized by the growing importance of word meaning and of prior knowledge. This stage is composed of two phases: Phase 1 of stage 3 covers grades 4-6 (9-11 years old) and children develop the ability to read beyond an egocentric purpose, reading texts that convey conventional knowledge of the world. Phase two of stage 3 covers grades 7-8 (12-14 years old): This stage brings readers close to adults reading level.

Stage 4 and beyond covers high school and is beyond the scope of this study. The characteristic of each developmental stage has been compared with what the Kenya Primary Syllabus recommends at that stage. This was then used in evaluating the course books for class two and five.
2.3 Readability studies in Kenya

The studies so far reviewed looked at the readability of classroom books, they restricted themselves to one aspect of readability; that is the linguistic correlates like words and sentence length, of text difficulty, particularly as they relate to readability formulas.

Obuya Deya (1980) whose major focus was on the relationship between Certificate of Primary Education (CPE) comprehension testing and classroom testing practices in primary schools used readability measures such as the Fry Readability Graph to determine the reading difficulty of CPE comprehension papers. A sample of two schools, both in Nairobi was used. The Comprehension tests were drawn from end of term, end of year and occasional tests in the school. His findings were that the passages used in the final examination had no relationships whatsoever with the reading levels of the learners because they were difficult.

He particularly noted the lack of assessment of the readability of the passages used in the classroom and the examination, a factor that he observed may have attributed to the poor reading habits of the primary school children. He also noted that comprehension exercises did not present reading to the pupils as a pleasurable activity. This observation is particularly important and reiterates the need for an evaluation of the readability of these passages. This study evaluated the readability of class two and class five English course books.

Barasa (1984) investigated the readability of a large number of textbooks used in Kenyan Secondary schools. First, a list of recommended and popular textbooks was
obtained by interviewing teachers, inspectors of schools, subject specialists, and others involved in secondary education. Out of these a short list was made of all books used by one school in Western Kenya.

Cloze passages were then prepared from all these books and subsequently administered to the concerned pupils at the schools. Readability measures were then used to assess the feature difficulty of all the selected text books using the comprehension measures obtained from cloze tests and the calculated readability indices, a fairly extensive analysis followed. The findings were mixed, some texts were found too difficult for their recommended levels while others were below those levels.

Although this study while informed by the schema and the dual coding theory looked at linguistic correlates of readability, it also looked at legibility of prints (type face, layout and the reading conditions) and illustrations. So far, such a study has not been done locally.

2.4. The influence of illustrations in children’s story books

Most children’s books contain illustrations, however, there has been little research on their effects and even less on the preference of children with respect to different types of illustrations.

Yet, illustrations preference is very important since it is suggested (e.g. the “motivation theory” proposed by Glenberg and Langston, 1992) that they make a book more appealing and thus, better engage the reader. The dual code theory / repetition
hypothesis proposes that information that is presented twice will enhance comprehension and Memory (Gyselinck, and Tardieu, 1999). Another theory suggests that pictures lure children to read and interact with the text and provide mental images, allowing them to understand the written text more easily and remember it longer (Fang, 1996). Illustrations may also increase the comprehension and retention of the text material (Read and Barnsley, 1977; Schallert, 1980).

A recent research carried out by J.Andrews, L.Scharff, L. Moses (2002) to determine the effects of illustrations on reading comprehensions and the specific illustrations that children prefer, had the following findings:

1. Regarding illustration preference of children (1st-3rd grades), bright realistic combination was preferred over somber abstract pictures. Participants especially liked bright pictures better than somber pictures.

2. Regarding the effects of illustration on comprehension, the text-plus illustration books led to significantly better comprehension than illustrations – only book or text only book.

These results suggest that pictures can serve as an aid to comprehension and they may help beginning readers to comprehend the story and learn new words based on the pictures. They also validate the theories that propose benefits for illustrated text. This information is important when evaluating the overall readability of a book. The illustrations were looked into against color (bright/somber), whether they were abstract or realistic and attention capturing.
Generally illustrations are important since they influence a child’s motivation to approach a book and, in turn, the child’s resultant comprehension of the book. This information is important to publishers since they may want to create focus groups to determine the children’s responses to proposed illustrations in new books.

2.5. Effects of Typeface and Font Size on Legibility for Children.

Much research has been dedicated to legibility and readability for adults. It is important to examine children as a specific population due to the effects that developmental changes and familiarity with characters may have on the readability of texts. Research supports that children process letter information more slowly than adults (Krueger, 1973), but they are able to discriminate small visual details (Gaines, 1969), which suggests that differences in texts such as typeface and size may also be discriminated. However, the discriminability may vary, and thus, these type of differences may influence the ease with which children can read. Because a majority of children’s reading materials is found in printed form, it is important to examine readability of printed text for children.

Although the publishing companies do have the guidelines, they are not based upon empirical data (e.g. CTB/McGraw-Hill, L.Gerbrandt, personal communication, May 2000). This study used guidelines based on findings of a recent research by K.Davis, R.Woods and L.Scharff (2001), to evaluate the typeface and font size of class 2 and 5 English Course books. K.Davis et al carried out a research to determine how font variables might influence letter discriminability and legibility. In this research two typefaces: Times New Roman (serif) and Arial (san serif) and two points sizes: 12 point
and 18 point were presented to children in grades of Kindergarten through 4. Participants were instructed to report whether letter pairs presented using a tachistoscopic slide projector were the same or different (discrimination) and write the letters they saw (identification, a measure of legibility). Presentation time for each letter pair was 0-2 seconds. A visual angle of the presented letters was calculated to match that for an average reading distance of 18 inches.

The results were that kindergarteners showed the worst performance on all conditions, and were the only group to show a significant decrease in performance from discrimination to identification. Overall, Arial was discriminated and identified better than Times New Romans, and the same pattern was seen for 18 point. These results are significant because they support previous research on adults that shows that legibility increases with point size (loomis, 1990; Smith 1979). They are also important because currently, larger font sizes (up to 24 point) are used for k-2 grades to compensate for challenges associated with early readers. The study assessed the typeface and font sizes against these findings.

2.6 Theoretical perspective.

The study was informed by the schema theory and the dual-coding theory as discussed below.

2.6.1 The schema theory

Schema theory is based on the belief that “every act of comprehension involves one’s knowledge of the world as well” (Anderson et al in Carrel and Eisterhold, 1983:73). Thus
readers develop a coherent interpretation of texts through the interactive process of combining textual information with the information a reader brings to a text (Widdowson and Grabe, 1988:56). Reader's mental stores are termed schemata and are divided into two main types: content schemata, that is, background knowledge of the world and formal schemata, which is the background knowledge of rhetorical structure (Cook, 1997; Carrel, 1983a). In this study, readability formulas were used to investigate the appropriateness of content schemata. This is because the formulas look into word and sentence difficulty. These two linguistic units represent one's knowledge of the world. Studying the layout or organization of the texts looked into the rhetorical structure.

In the process of reading, comprehension of a message entails drawing information from both the message and the internal schemata until the two sets are reconciled as a single schema or message (Anderson et al., in Hudson, 1982:187). It is also claimed that the first part of a text activates a schema which, is either confirmed or disconfirmed by what follows (Wallace, 1992: 33) but the process begins much earlier than this. The environment sets up powerful expectations: We are already prepared for certain genres but not for others before we open a newspaper, a scholarly journal or a box containing some machine we’ve just bought. The reading process, therefore, involves identification of genre, formal structure and topic, all of which activate schemata and allow readers to comprehend a text (Swales, 1990:88 - 89). This observation is very useful in evaluating texts. The kind of genres that young Kenyan readers of class 2 and 5 are exposed to should be the familiar ones like African oral narratives.
The schema theory was very significant to this study as it informed the evaluation of content of texts by looking at the word and sentence complexity. Carrel and Eisterhold (1983:80) point out that one of the most obvious reasons why a particular content schema may fail to exist for a reader is that the schema is culturally specific and is not part of a particular reader's cultural background. It is thought that readers' cultures can affect everything from the way readers' view reading itself, the content and formal schemata they hold, right down to their understanding of individual concepts.

For learners reading at the limits of their linguistic abilities like the class two readers, Acersold and Field (1997:41) observes:

> If the topic.... is outside of their experience or base knowledge, they are adrift on an unknown sea.

When faced with such unfamiliar topics, some readers may overcompensate for absent schemata by reading in a slow text-bound manner; other students may compensate by wild guessing (Carrel, 1988a: 101). Both strategies inevitably result in comprehension difficulty. Research by Johnson (in Carrel and Eisterhold, 1983: 80) suggested that a text on a familiar topic is recalled well than a similar text on unfamiliar topic. Swales (1990:87) observes that this and other research supports the common sense expectancies that when content and form are familiar the text will be relatively accessible. This accessibility was assured by use of a readability formula.

The reading process has famously been described as "a psycholinguistic guessing game" (Goodman, in Carrel, and Eisterhold, 1983:74) in which efficient readers minimise dependencies on visual detail by utilising background knowledge to make...
predictions and checking this against the texts (Goodman, 1975:12). Such top-down models have unfortunately given the misleading message to teachers that ESL reading tuition is mostly just a matter of providing learners with the right kind of background knowledge and encouraging them to make full use of that knowledge in decoding texts (Eskey, 1988:97). It is now recognised that language is a major problem in ESL reading and ESL readers need a massive receptive vocabulary that is rapidly, accurately and automatically accessed (Grabe, 1988:63). This calls for the use of readability formulas to assess the reading levels of texts.

The importance of lexico-grammatical focus, particularly in the early stages of learning needs to be recognized. Carrel (1988b: 244) suggests a parallel approach in which vocabulary and schemata are developed by pre-teaching vocabulary and background knowledge concurrently for sets of passages to be read at some later time. A good text should therefore, have a list of vocabulary to be learnt presented separately and taught before learners can read them in texts. This can help SL learners build and improve the schemata they need for a fuller enjoyment of texts.

Schema theory has offered an explanation on reading comprehension and memory based on experience or background knowledge. However, it neither tells us how readers process these information nor the role that language per se plays in reading comprehension. Such knowledge would have been very useful in informing the use of readability formulas. Schema theory does not tell us about the role of illustrations or legibility in readability of texts. For this reasons the dual coding theory will be used to inform that kind of evaluation.
2.6.2. Dual Coding Theory

According to Paivio [1991], Dual Coding Theory evolved from his studies on the role of imagery in associative learning. These studies marked the first systematic objective measurement of the effects of imagery on memory.

Dual coding theory proposes that memory consists of two separate but interrelated codes for processing information – one verbal and the other visual. The verbal and visual system can be activated independently but there are interconnections between the two systems that allow dual coding of information. The interconnectedness of the two systems permits cueing from one system to the other which in turn facilitates the interpretation of our environment. (Rieber, 1994; Simpson, 1995).

Each system has different functions, storage processing characteristics and memory units (Rieber, 1994); the verbal system specializes in processing and storing linguistic information such as words and sentences. Information is stored in discrete, sequential units that are called logogens. In contrast, the visual system specializes in processing and storing image or picture like representations. Processing in the visual system is believed to be more holistic and based on continuous organizational units termed imagens. Chan Lin (1994) illustrates this point through the example of a face, which if processed visually, is perceived concurrently as a whole made up of distinctive sub elements like eyes, nose and mouth, often to an astonishing level of detail. A verbal representation, on the other hand, requires a sequential description of each individual element. Thus, in this type of representation, the level of detail is directly proportional to the length of the description.
DCT is important because it proposes that information is much easier to retain and retrieve when dual coded because of the availability of two mental representations instead of one (Paivio, 1991). Furthermore, pictures are more likely to activate both coding systems upon processing than words. As a result, Paivio claims "a mnemonic superiority of the image code over the verbal code" (Paivio 1991:625) which makes pictures easier to remember than words. In addition, according to Rieber (1994) recalling information contained in the visual system is much faster than recalling information in the verbal system because the visual system accesses information through synchronous processing, as opposed to sequential access of information stored in the verbal system. Chan Lin (1994:7) quotes several studies producing empirical evidence that supports these claims.

However, not all theorists agree with the basic principles and assumptions of dual coding theory. For example, the picture superiority assumption has been questioned since the differences in recall are reduced if words are deeply imagery encoded (Paivio, 1991). It is unclear, however, whether this reduction also occurs without elaborate coding of either pictures or words.

DCT has also been criticized for not taking into account the variable abilities people have for processing information. Simpson (1995) points out that age seems to play a role in determining the use of modalities. He argues that younger individuals process information more so in the visual modality than the semantic.
Although arguments against OCT exist, it remains the dominant theory that informs the evaluation of illustrations in course books and readability in general as it directly addresses the role of images in cognition and offers a theoretical framework for designing and developing visuals. In fact, an impressive amount of empirical evidence supporting the usefulness of illustrated instructional material on learning and retention has been amassed over the years (Mayer, 1994). For example, Levie and Lentz reviewed 23 studies that included 48 comparisons of learning illustrated text information from illustrated text versus text alone. He found that in all but one of these 48 cases, the groups mean for reading illustrated text was superior to that of the group reading text alone (1982: 198).

The usefulness of illustrations for instructional application is further confirmed in several research studies reviewed by Rieber (1994). He derived some general conclusion on the effects of the illustration on text and suggested that illustrations are:

1. Effective interest getting devices.
2. Help the learner interpret and remember the content of the illustrated text.
3. Are more effective in realistic colour than black and white.
4. Draw more attention if they are large.
5. Should conform to eye movement tendencies. He concluded that:
   ♦ Pictures are superior to words for memory tasks.
   ♦ Adding pictures [external/internal] improve learning, assuming that the pictures are congruent to the learning tasks.
   ♦ Children up to the age of 9 or 10 rely more heavily on externally provided pictures than do older children.
Children do not automatically or spontaneously form mental images when reading (1994:141). This justified the inclusion of illustrations in the study and the evaluation of their appropriateness.
CHAPTER THREE

3.0 METHODOLOGY:

3.0.1 The Subjects:

Subjects of this study were class two and class five English course books currently being used in Kenyan primary schools, and their respective teachers. The textbooks selected were

(1) One main course book for class two and five. These were:
   (a) KIE (1997)- *New Progressive Primary English two* Nairobi: OUP
   (b) KIE (1997) *Primary English Book five* Nairobi: JKE.

(2) One supplementary reading from a list that is provided by Ministry of Education for each of the above classes. The following were selected:
   (a) Brasnett C. and Wandera L. (1976)- *Read and Write* JKF.
   (b) KIE (1997) *New Progressive Primary English five* Nairobi: OUP

(3) Two other popular books that are not among the recommended supplementary readings but are also used in class two and five.
   (a) Patel M.S.- (1986) *English Aid Book five* Nairobi: Jyoti Bindu
   (b) Patel I. S. – *Read and Write* Std five Nairobi: Malimu
   (c) Patel M.S.- (1986) *English Aid two* (Red) Nairobi: Jyoti Bindu
   (d) Shah and Patel- *Read and Write* Std two Nairobi: Malim

The core book was confirmed from the list of approved books by the Ministry of Education. The second and the third category of books were selected only after
interviewing the concerned teachers and only after confirming from them that they actually use them.

Class Two course books were chosen to be representative of lower primary. In the Kenyan Education System, a pupil in class one and two is acquiring reading skills; that is, recognition and identification of letters, numbers, lexical items and grammatical forms (Mberia 2002). They are beginning readers and of them Bruno Bettelheim (1982:263) Observes,

"What is needed is beginning text that fascinate children and convince them that reading both is delightful and helps one to gain better understanding of oneself and others. To achieve this, primary (1-4) textbooks should stimulate and enrich a child's imaginations as fairy tales do"

Chall (1983) observes that children at this stage (7-8 years) read not for gaining new information, but for confirming what is already known.

Class Five was chosen to be representative of upper primary. At this level the reader has developed sufficient word bank and can read for comprehension and meaning (Owino 1986). According to Chall (1983) a child at this stage (9-11 years) has the ability to read beyond an egocentric purpose, and can read text that conveys conventional knowledge of the world.
A minimum of 4 stories of not less than one hundred words was selected from each of the above books for analysis. This was purposively done by choosing every 1st, 4th, 8th and 16th comprehension passage. However, there were exceptions. English aid book two had only two comprehension passages. Therefore, the two were selected for analysis. English aid book five had only 4 comprehension passages and all these were selected for analysis.

All the books were subjected to assessment of the legibility of print (font and size), organization of text, reading conditions and illustrations. These were looked at against the whole of each text.

To establish the level of interest of a story, the Flesh Human Interest formula requires at least 100 sentences. This was quite limiting since most passages, especially, for class two had stories with very few sentences, as few as seven, and even when stories were combined the sentences were still less than 100. The books which qualified for this kind of analysis were Primary English book five and Junior English book five. For the rest of the books a checklist was constructed to evaluate their levels of interest.

The teachers who participated in the study were class two and class five English teachers from Joel Omino primary school which is a public school situated in the sprawling Nyalenda slums in Kisumu town. The others were teachers from Shady Garden Academy a private school situated in the posh Milimani suburbs of Kisumu town. The third groups of teachers were from Ulalo, a public primary
school in Kisumu rural. The choice of these schools was on the basis that they belong to the different social and economic classes hence they represent social stratification in the society.

Social stratification is considered because research has showed that reading ability of most learners is influenced by social class (Deutch M. 1965). The gist of his findings was that it is the norm for upper middle class children to be a year ahead of grade level from the end of first grade onwards. While for lower working class, they fall back until they are a year or more behind by the time they reach fourth or fifth grade. In this study, Shady Garden was representative of middle class while Joel Omino was representative of the working class. The rural Ulalo school represents a majority of the rural children in the country.

3.1 Data Collection Instruments.

The following were used for data collection and analysis.

1. Readability Formulas
2. Checklist
3. Questionnaire

3.2 Readability Formulas

A readability formula uses counts of language variable in a piece of writing in order to provide an index of probable difficulty for readers. It is a predictive device in the sense that no actual participation of the reader is needed.
Subjective assessment has been shown to be inaccurate, with teachers (perhaps because of their reading competence and familiarity with the subject) usually underestimating the difficulty of the text (by up to 8 years). This study while informed by the schema theory used readability formulas that rely on linguistic correlates such as sentence length and vocabulary to find grade levels of texts. These formulas use counts of word length, sentence length and vocabulary as the main variables. They have an impact on the comprehension as has been demonstrated over the years.

In early reading development, the increase in sentence length hinders comprehension. This is because the longer a sentence is, the more the propositions (predicator and arguments) children, especially beginning readers have difficulty storing and processing information. This, according to Baddeley et al (1975) is due to their short attention span and little memory size (short term memory). Baddeley adds that familiar words do not take much memory space because of the effect of automaticity. This supports the schema theory, which proposes that what is already known (background knowledge) aids in understanding new information. In reading passages, familiar words facilitate comprehension. Most familiar words have few syllables. These are some of the linguistic units these formulas look into. The formulas also look into percentages of difficult words in a passage (vocabulary).
The main methods of objective assessment used in this study were:

1. Calculations involving the number of syllables and the sentence length: Flesch Reading Ease Formula, Human Interest Formula, and Powers-Sumner-Kearl formula.

I. Flesch Reading Ease Formula

It is used to measure the readability of a passage. This is how it is calculated:

- Systematically select 100 words samples from the text.
- Determine the number of syllables per the 100 words.
- Calculate the average number of words per sentence.
- These two factors are represented by \( w_i \) (word length) and \( s_l \) (sentence length) respectively in the formula given below.

Apply the following equation:

\[
\text{Reading ease} = 206.835 - 0.846 \times w_i - 1.015 \times s_l
\]

Reading ease represents the grade level, which would have to be attained in order to read a passage.

II. Human Interest Formula

- Select 100 words sample as above.
- Count the number of personal words per the 100 words \( (pw) \) in the formula.
- Count the number of personal sentences per 100 sentences \( (ps) \) in the formula.
- Calculate the equation:

\[
\text{Human interest} = 3.635pw - 314ps.
\]
Personal names and person pronouns are considered as personal words. However, *it* or *they* that refers to things not people are not counted. Nouns like *aunt, widower* or *guy* where gender is clear should be counted as personal words whereas nouns like *teacher, student, doctor* e.t.c. where gender is not clear should not be counted.

Personal sentences are sentences such as dialogue; questions, commands, requests directly addressed to the reader (e.g. "This is a point you must remember"), exclamations; and incomplete sentences whose meaning has to be referred from the context (e.g. "An absolute genius", "well, certainly he would").

The factors that the above formula measures reflect aspects of the difficulty of reading single words and sentences. The word factor may be seen as a measure of semantic difficulty since syllable counts are a reflection of word length. The higher syllable counts will tend to measure unfamiliarity of words and therefore difficulty of meaning. The sentence measure used is a reflection of memory span, since the longer a sentence the more difficult it will be to remember the parts and so the more difficult it will be to be understand.

This formula reflects a wider range of linguistics skills within the primary and intermediate range. It is also reliable. Evidence of numerous validation studies involving this formula is to be found in Klare (1963). These studies use different criteria such as comprehension test scores, expert judgment and speed of reading. For example, Klare reported correlation between the reading ease formula and the Ojemann and Gray and Leary reading test of .82 and .55 respectively. Klare also reported
correlation with expert judgment ranging from .61 to .84. The highest correlation reported was between the Flesch and the Dale Chall readability formula. It was 98.

III. Powers-Sumner -Kearl
This is one of the formulas suitable for primary age books.

Select samples of 100 words.

- Calculate $L$, the average sentence length (number of words divide by number of sentences). Estimate the number of sentences to the nearest tenth, where necessary.
- Count $N$, the number of syllables per 100 words.

Then grade level = $(L \times 0.0778) + (N \times 0.0455) - 2.2029$

So Reading Age = $((L \times 0.0778) - (N \times 0.0455) + 2.7971)$ years.

In counting words for the formulas above, contractions, hyphenated words, abbreviations, figures, symbols and their combinations e.g. wouldn't, full-length, T.V, 17, &, Ksh. 15, 7% were considered single words.

Syllables were counted in words as they are pronounced. Abbreviations, figures, symbols and their combination were considered as one-syllable words. Where a word had two accepted pronunciations, the one with fewer syllables was taken. Examples of syllable counts are: another (3), area (3), passed (1), surface (2), km (1), e.g. (1).

In counting sentences, each full unit of speech marked off by a period, colon, semicolon, dash, question mark or exclamation point was considered as a sentence.
Paragraph breaks, colons, semicolons, dashes or initial capitals within a sentence were disregarded.

2. Calculations involving comparison of a text using standard word list:

**The Spache Readability Index.**

This is used to measure the readability of primary level texts.

- Select a text sample of 100-150 words from a primary level text.
- Count the total number of words in the reading sample.
- Calculate the average sentence length by dividing the number of words (item 1) by the number of sentences (item 2).
- Count up the number of words in the sample that are not found on the Spache Revised word list (difficult words). Note: count each difficult word only once.
- Calculate the percentage of difficult words by dividing the number of words (item 4) by total number of words in the sample (item 1) and multiplying by 100.

\[
\text{Spache Readability Index} = (0.141) \times \text{(Average sentence length)} + (0.086) \times \text{(Percentage of difficult words)} + (0.839)
\]

Guidelines for identifying “Difficult words” in the Spache Readability formula:

Familiar words: The following were counted as familiar or ‘known’ words.

- Words appearing on the Revised Spache word list.
- Variants of words from the Revised Spache word list that have regular verb form endings –ing, -ed, -es.
- Plural and possessive endings of nouns from Revised Spache word list.
- First names.
Single letters standing alone as words e.g. "B is the second letter of the alphabet".

Words that were considered as unfamiliar (difficult words /words not on the Spache word list) are counted only once even if they appear later with other endings.

The following were considered as unfamiliar or 'unknown' words:

- Words not appearing on the Revised Spache word list (other than first names).
- Variants of words from the Revised Spache word list that have irregular verb form endings-unless those variant forms also appear on the Spache list.
- Variants of words from the Revised Spache word list that have adverbial, comparative, or superlative endings e.g., -ly, -er, -est.

The above formulas test only readability. Readership, comprehension and retention also depend on other factors: Content, format, logical organization, redundancy and reading motivation. (Gray W.S, Learry BE 1935). Readability has been shown to correlate with the level of readership and retention of newspaper articles. Readability may also promote retention of information (Swanson C. 1948; 25: 339-345).

3.3 Checklist

This was used to assess the legibility of texts (type face, font size and illustrations). To address the overall suitability of print materials, including reading grade levels, a checklist that looked into graphics, layout, typography and illustrations was used.
a) The type

There are several type faces in use in Kenya today, some much more legible than others. However, san serif (Arial) is recommended for children’s text (Gilliland, 1975: 35). Graphic designer Jody (2000) observes that Arial not only gives a document a modern look but also is also easy to read. Times Roman has also been popularly used and it has been observed that there is a significant difference in its legibility when compared with Arial. The typeface of every textbook in the study was identified.

b) The layout

There are 4 interrelated factors here:

- The size of type.
- The length of line.
- The spacing between the lines (the leading) and,
- The weight of print.

If the size of type or length is changed then the leading should be altered to maintain efficient eye movement. 10 point, 11 point and 12-point type are the best sizes for fluent readers. At the normal reading distance of 35cm, 10 point brings 4 letters within the forveal area and 20 letters within a 5-degree field view. For a 10-point typeface, the leading is normally 4.2mm. For kindergarteners to grade 3 learners larger fonts up to 24 are recommended (Keith Johnson, 2001).
Lines that are too short or too long cause inefficient eye movement. When considering the speed of reading, researchers have recommended line lengths in the range of 6-9cm (depending on the size of type and leading). An A4 worksheet may have lines of 18cm.

Tinker (1963) advocates a series of safety zones within which type size, line length may be varied. Some schoolbooks appear to lie outside these safety zones. Overall, line lengths of 7-12 average words seem optimum.

Unjustified lines (i.e. where the right hand edge of the text is not straight) are better because they help the reader’s eye to scan the lines more accurately. White space (between paragraphs), and sub-heads, help for the same reason. All the selected books in this study were evaluated for layout.

c) **Reading Conditions**

Serious effects on legibility arise when vibration occurs with a hand-held book and when the line of vision is not at right angles to the plane of the page. Books with thick spine may cause difficulty due to the curvature of the page particularly where the inner margin is narrow. The thicknesses of the spine of all the books were considered. The size of margin does not seem to affect the speed of reading, but may cause increased eye fatigue if it is too narrow.

Matt paper causes less eye fatigue than glossy paper. The paper should be thick enough to prevent the print in the reverse side showing through.
Black type on white paper is more legible than any other colour combination blue, red and green on white are often acceptable especially when they are used to highlight certain words.

d) Illustrations

Illustrations are known to enhance learning and that children up to 10 years rely heavily on them for comprehension. This is made possible when the pictures are bright and realistic (resemble photographs) and are congruent to the learning task. The Dual Coding Theory informs the evaluation of illustrations as it claims a "mnemonic" superiority of the visual code over the verbal code. This means that illustrated texts are easily comprehended and recalled.

The illustrations were evaluated against:

- Bright realistic.
- Bright abstract.
- Sombre realistic.
- Sombre abstract.
- Stereotypes e.g. women in the kitchen, male doctors e.t.c.
- Cultural and religious appropriateness.
- Relevance to the story.
3.4 Questionnaire

Readability formulas can only provide objective estimates of reading difficulty. The teacher who is in constant touch with readers and the textbooks is the one who can know the actual position with regard to the difficulty of the text. The questionnaires were used to elicit information on whether teachers evaluate reading materials that they use to teach reading and how they do this. They also elicited the teachers' observation on the difficulty of the texts under study. This information was then compared with the results of the readability evaluation.
4.0 Results

This study was conducted to assess the readability of class two and class five English course books. This was done by calculating the reading grade levels, assessing the legibility of print and organization of text. The study also evaluated illustrations and interest levels of these books. It also sought out teachers' opinions on the above. The Schema Theory and the Dual Coding Theory mainly informed the study.

4.1 Reading Grade Levels and Human –Interest Scores

In an attempt to calibrate some fixed points on the scale of readability, the averages of the results of each passage that was subjected to readability test for every book was found. Similarly, an average of two tests (Spache and Sumner Powers and Kearl) was found for every book.
Class Five English books.

i) Primary English- JKF

<table>
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<th>Page</th>
<th>Number of Syllables (wl)</th>
<th>Average Number of Words per Sentence (sl)</th>
<th>% of difficult Words</th>
<th>Personal Sentences</th>
<th>Personal Words</th>
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<td>9.8</td>
<td>6</td>
<td>47</td>
<td>10</td>
</tr>
<tr>
<td>30-32</td>
<td>140</td>
<td>12.2</td>
<td>5</td>
<td>47</td>
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<td>135</td>
<td>10.71</td>
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<td>96-97</td>
<td>140</td>
<td>10.71</td>
<td>4</td>
<td>47</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 1

This is for every first 100 words.

Flesch Reading Ease.

Story 1 (Page 1-2)

Reading Ease = 206.835 - 0.846wl - 1.15sl

= 206.835 - (0.846 × 144) - (1.015 × 9.8)

= 206.835 - 121.824 - 9.947

= 75.064

Story 2 (Page 30-32)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 × 140) - (1.015 × 12.2)
Story 3 (Page 66-67)

Reading Ease = $206.835 - 0.846wl - 1.015sl$

= $206.835 - (0.846 \times 135) - (1.015 \times 6.71)$

= $206.835 - 114.21 - 6.81065$

= $85.814$

Story 4 (Page 96-97)

Reading Ease = $206.835wl - 0.846wl - 1.015sl$

= $206.835 - (0.846 \times 140) - (1.015 \times 10.71)$

= $77.5345$

**Sumner- Powers - Kearl**

Story 1 (Page 1-2)

Grade Level = $(L \times 0.0778) + (N \times 0.0455) - 2.2029$

= $(9.8 \times 0.0778) + (144 \times 0.0455) - 2.2029$

= $4.425$

Reading Age = $(L \times 0.0778) + (N \times 0.0455) + 2.7971$

= $(9.8 \times 0.0778) + (144 \times 0.0455) + 2.7971$

= $10.112$ years
Story 2 (Page 30-32)

Grade Level = (L x 0.0778) + (N x 0.0455) - 2.2029

= (12.2 x 0.0778) + (140 x 0.0455) - 2.20

= 5.11626

Reading Age = (L x 0.0778) + (N x 0.0455) + 2.7971

= (12.2 x 0.0778) + (140 x 0.0455) + 2.7971

= 10.116 years

Story 3 (Page 66-67)

Grade Level = (L x 0.0778) + (N x 0.455) - 2.2029

= (10.71 x 0.0778) + (135 x 0.455) - 2.2029

= 4.77

Reading Age = (L x 0.0778) + (N x 0.0445) + 2.7971

= (10.71 x 0.0778) + (135 x 0.0445) + 2.7971

= 9.77 years

Story 4 (Page 96-97)

Grade Level = (L x 0.0778) + (N x 0.0455) - 2.2029

= (10.7 x 0.0778) + (140 x 0.0455) - 2.2029

= 5.000
Reading Age = (L×0.0778)+ (N×0.0455) +2.7971

= (10.71 ×0.0778 ) + (140 × 0.0455) +2.7971

= 10.00 years

Spache Readability Index

Story 1 (Page 1-2)

Grade Level = (0.141×L)+ (0.086×N) +0.839

=(0.141×9.8) + (0.086 ×6) + 0.839

= 2.735

Story 2 (Page 30-32)

Grade Level = (0.141×L)+ (0.086×N)+ 0.839

=(0.141×12.2) + (0.086 ×5) + 0.839

= 2.98

Story 3 (Page 66-67)

Grade Level = (0.141×L) + (0.086 ×N) +0.839

=(0.141×10.71) + (0.086×6) +0.839

= 2.873

Story 4 (Page 96-97)

Grade Level = (0.141×L) + (0.086×N) +0.839

=(0.141×14.14) + (0.086× 4) +0.839
Flesch Human Interest

Story 1 (Page 1-2)

Human Interest = 3.635pw +0.314ps

= (3.635 \times 10) + (0.314 \times 47)

= 51

Story 2 (Page 30-32)

Human Interest = 3.635pw + 0.314ps

= (3.635 \times 9) + (0.314 \times 47)

= 47.473

Story 3 (Page 66-67)

Human Interest = 3.635pw + 0.314ps

= (3.635 \times 9) + (0.314 \times 47)

= 47.473

Story 4 (Page 96-97)

Human Interest = 3.635pw + 0.314ps

= (3.635 \times 5) + (0.314 \times 47)

= 32.933
Table 2
This is for every first 100 words.

**Flesch Reading Ease**

**Story 1 (Page 2-3)**

Reading Ease = \(206.835 - 0.846wl - 1.015sl\)

\[=206.835-(0.846\times135)-(1.015\times10)\]

\[=82.975\]

**Story 2 (Page 14-15)**

Reading Ease = \(206.835 - 0.846wl - 1.015sl\)

\[=206.835-(0.846\times157)-(1.015\times10)\]

\[=79.937\]
Story 3 (Page 36-37)

Reading Ease = 206.835 - 0.846wl - 1.015sl
  = 206.835 - (0.846 \times 138) - (1.015 \times 11.1)
  = 78.821

Story 4 (Page 54-55)

Reading Ease = 206.835 - 0.846wl - 1.015sl
  = 206.835 - (0.846 \times 136) - (1.015 \times 8)
  = 83.659

Average Reading Ease = \frac{\sum n}{x} = 325.3915
  = 81.34

Powers-Sumner - Kearl

Story 1 (Page 2-3)

Grade Level = (L \times 0.0778) + (N \times 0.0455) - 2.2029
  = (10 \times 0.0778) + (135 \times 0.0455) - 2.2029
  = 4.717

Reading Age = (L \times 0.0778) + (N \times 0.0455) + 2.2029
  = (10 \times 0.0778) + (135 \times 0.0455) + 2.7971
  = 9.717

Story 2 (Page 14-15)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029
  = (10 \times 0.0778) + (157 \times 0.0445) - 2.2029
Reading Age = \((L \times 0.0778) + (N \times 0.0445) + 2.2029\)
\[= (10 \times 0.0778) + (157 \times 0.0445) + 2.7971\]
\[= 10.7186\]

Story 3 (Page 36-37)
Grade Level = \((L \times 0.0778) + (N \times 0.0445) - 2.2029\)
\[= (11.1 \times 0.0778) + (138 \times 0.0445) - 2.2029\]
\[= 4.9397\]
Reading Age = \((L \times 0.0778) + (N \times 0.0445) + 2.2029\)
\[= (11.1 \times 0.0778) + (138 \times 0.0445) + 2.7971\]
\[= 9.9397\]

Story 4 (Page 54-55)
Grade Level = \((L \times 0.0778) + (N \times 0.0445) - 2.2029\)
\[= (12.5 \times 0.0778) + (136 \times 0.0445) - 2.2029\]
\[= 6.9579\]
Reading Level = \((L \times 0.0778) + (N \times 0.0445) + 2.7971\)
\[= (12.5 \times 0.0778) + (136 \times 0.0445) + 2.7971\]
\[= 9.9576\]
Average Reading Level = \(\sum \frac{n}{x} = \frac{22.334}{4}\)
\[= 5.5\]
Average Reading Age = \(\sum \frac{n}{x} = \frac{40.3329}{4}\)
Spache Readability Index

Grade Level = (0.141 \times \text{Average sentence length}) + (0.086 \times \% \text{ of difficult words}) + 0.839

Story 1 (Page 2-3)

Grade Level = (0.141 \times 10) + (0.086 \times 4) + 0.839

= 2.59

Story 2 (Page 14-15)

Grade Level = (0.141 \times 10) + (0.086 \times 6) + 0.839

= 2.765

Story 3 (Page 36-37)

Grade Level = (0.141 \times 11.1) + (0.086 \times 3) + 0.839

= 2.6623

Story 4 (Page 54-55)

Grade Level = (0.141 \times 12.5) + (0.086 \times 8) + 0.839

= 3.2895

Average Reading Grade = \frac{\sum n}{x} = \frac{11.3065}{4}

= 2.826

= 3
Flesch Human Interest

Story 1 (Page 2-3)

Human Interest = 3.635pw + 0.314ps

\[ (3.635 \times 10) + (0.314 \times 77) \]

= 60.528

Story 2 (Page 14-15)

Human Interest = 3.635pw + 0.314ps

\[ (3.635 \times 9) + (0.314 \times 77) \]

= 56.893

Story 3 (Page 36-37)

Human Interest = 3.635pw + 0.314ps

\[ (3.635 \times 11) + (0.314 \times 77) \]

= 64.163

Story 4 (Page 54-55)

Human Interest = 3.635pw + 0.314ps

\[ (3.635 \times 0) + (0.314 \times 77) \]

= 24.178

Average Human Interest = \[ \frac{205.762}{4} \]

= 51.4
Table 3

This is for the first 100 words.

Flesch Reading Ease

Story 1 (Page 63)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 × 144) - (1.015 × 12.375)

= 97.835

Story 2 (Page 64)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 × 150) - (1.015 × 11)
Story 3 (Page 65-66)

Reading Ease = 206.835 - 0.846wl - 1.015sl

\[= 206.835 - (0.846 \times 130) - (1.015 \times 13.85)\]

\[= 82.848\]

Story 4 (Page 66-67)

Reading Ease = 206.835 - 0.846wl - 1.015sl

\[= 206.835 - (0.846 \times 128) - (1.015 \times 14.6)\]

\[= 83.728\]

Average Reading Ease = \(\sum n/x = 333.17/4\)

\[= 83.29\]

Powers - Sumner - Kearl

Story 1 (Page 63)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

\[= (12.375 \times 0.0778) + (144 \times 0.0445) - 2.2029\]

\[= 5.3119\]

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

\[= (12.375 \times 0.0778) + (144 \times 0.0445) + 2.7971\]

\[= 10.3119 \text{ years}\]
Story 2 (Page 64)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

= (11 \times 0.0778) + (150 \times 0.0445) - 2.2029

= 5.4779

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

= (11 \times 0.0778) + (150 \times 0.0445) + 2.7971

= 10.4779 years

Story 3 (Page 66-67)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

= (13.85 \times 0.0778) + (130 \times 0.0445) - 2.2029

= 4.7896

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

= (13.85 \times 0.0778) + (130 \times 0.0445) + 2.7971

= 9.7896 years

Story 4 (Page 66-67)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

= (14.6 \times 0.0778) + (128 \times 0.0445) - 2.2029

= 4.75698

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

= (14.6 \times 0.0778) + (128 \times 0.0445) + 2.7971

= 9.75698 years
Spache Readability Index

Story 1 (Page 63)

Grade Level = (L×0.141) + (N×0.086) + 0.839

=(12.375×0.141)+(0.774×0.086)+0.839

=3.3579

Story 2 (Page 64)

Grade Level = (L×0.141) + (N×0.086) + 0.839

=(11×0.141)+(23×0.086)+0.839

=4.368

Story 3 (Page 65-66)

Grade Level = (L×0.141) + (N×0.086) + 0.839

=(13.85×0.141)+(14×0.086)+0.839

=3.99585

Story 4 (Page 66-67)

Grade Level = (L×0.141) + (N×0.086) + 0.839

=(14.6×0.141)+(17×0.086)+0.839

=4.359

Average Grade Level = Σn/x = 16.0807/4

= 4.020
### Table 4

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<th>Average number of words per sentence (sl).</th>
<th>% of difficult words.</th>
<th>Number of personal words.</th>
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<td>16</td>
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This is for the first 100 words.

**Flesch Reading Ease.**

**Story 1 (Page 69-70)**

Reading Ease = \(206.835 - 0.846\timeswl - 1.015\timessl\)

\[
= 206.835 - (0.846 \times 139) - (1.015 \times 14.6)
\]

\[
= 74.417
\]

**Story 2 (Page 71-72)**

Reading Ease = \(206.835 - 0.846\timeswl - 1.015\timessl\)

\[
= 206.835 - (0.846 \times 129) - (1.015 \times 14.286)
\]

\[
= 83.202
\]
Story 3 (Page 73)

Reading Ease = 206.835 - 0.864wl - 1.015sl

= 206.835 - (0.846 \times 146) - (1.015 \times 16.667)

= 66.402

Story 4 (Page 74-75)

Reading Ease = 206.835 - 0.864wl - 1.015sl

= 206.835 - (0.846 \times 133) - (1.015 \times 16)

= 78.067

Average Reading Ease = \frac{\sum n}{x} = \frac{302.088}{4}

= 75.52

Powers-Sumner - Kearl

Story 1 (Page 69-70)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

= (14.6 \times 0.0778) + (139 \times 0.0445) - 2.2029

= 5.2575

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

= (14.6 \times 0.0778) + (139 \times 0.0445) + 2.7971

= 10.2341 years

Story 2 (Page 71-72)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

= (14.285 \times 0.0778) + (129 \times 0.0445) - 2.2029
Reading Age = (L × 0.0778) + (N × 0.0445) + 2.7971

= (14.285 × 0.0778) + (129 × 0.0445) + 2.7971

= 9.7776 years

Story 3 (Page 73)

Grade Level = (L × 0.0778) + (N × 0.0445) - 2.2029

= (16.667 × 0.0778) + (146 × 0.0445) - 2.2029

= 5.737

Reading Age = (L × 0.0778) + (N × 0.0445) + 2.7971

= (16.667 × 0.0778) + (146 × 0.0445) + 2.7971

= 10.7371 years

Story 4 (Page 74-75)

Grade Level = (L × 0.0778) + (N × 0.0445) - 2.2029

= (18 × 0.0778) + (133 × 0.0445) - 2.2029

= 5.0934

Reading Age = (L × 0.0778) + (N × 0.0445) + 2.7971

= (18 × 0.0778) + (133 × 0.0445) + 2.7971

= 10.249 years

Average Grade Level = \( \frac{\sum n}{x} = \frac{20.8654}{4} \)

= 5.216
Average Reading Age = \sum n/x = 40.998/4
                        = 10.25 years

Spache Readability Index

Story 1 (Page 69-70)
Grade Level = (0.141 \times L) + (0.086 \times N) + 0.839
             = (0.141 \times 14.6) + (0.086 \times 16) + 0.839
             = 4.2736

Story 2 (Page 71-72)
Grade Level = (0.141 \times L) + (0.086 \times N) + 0.839
             = (0.141 \times 14.285) + (0.086 \times 9) + 0.839
             = 3.627

Story 3 (Page 73)
Grade Level = (0.141 \times L) + (0.086 \times N) + 0.839
             = (0.141 \times 16.667) + (0.086 \times 8) + 0.839
             = 3.877

Story 4 (Page 74-75)
Grade Level = (0.141 \times L) + (0.086 \times N) + 0.839
             = (0.141 \times 16) + (0.086 \times 9) + 0.839
=3.869

Average Grade Level=$\sum n/x=15.6466/4$

=3.9116

**New Progressive book 2**

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<th>Number of Personal words.</th>
<th>Number of Personal sentences.</th>
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<td>17</td>
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<td>8</td>
<td>20</td>
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<td>56-57</td>
<td>142</td>
<td>9.5</td>
<td>7</td>
<td>10</td>
<td>48</td>
</tr>
</tbody>
</table>

**Table 5**

This is for the first 100 words.

**Flesch Reading Ease**

Story 1(Page 2-3)

Reading Ease=$206.835-0.846wl-1.015sl$

=$206.835-(0.846\times141)-(1.015\times4.9)$

=$82.5755$
Story 2 (Page 12-13)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 \times 134) - (1.015 \times 11.5)

= 81.7985

Story 3 (Page 22-23)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 \times 139) - (1.015 \times 9.6)

= 79.497

Story 4 (Page 46)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 \times 153) - (1.015 \times 6.35)

= 70.951

Story 5 (Page 56-57)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 \times 142) - (1.015 \times 9.5)

= 77.0605

Powers-Sumner - Kearl

Story 1 (Page 2-3)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029
Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971 \\
= (4.9 \times 0.0778) + (141 \times 0.0445) + 2.7971 \\
= 4.5938 \text{ years}

Story 2 (Page 12-13)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029 \\
= (11.5 \times 0.0778) + (134 \times 0.0445) - 2.2029 \\
= 4.7888

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971 \\
= (11.5 \times 0.0778) + (134 \times 0.0445) + 2.7971 \\
= 9.7888 \text{ years}

Story 3 (Page 22-23)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029 \\
= (9.6 \times 0.0778) + (139 \times 0.0445) - 2.2029 \\
= 4.8685

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971 \\
= (9.6 \times 0.0778) + (139 \times 0.0445) + 2.7971 \\
= 9.8685 \text{ years}
Story4 (Page 46)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029
= (6.35 \times 0.0778) + (153 \times 0.0445) - 2.2029
= 5.2526

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971
= (6.35 \times 0.0778) + (153 \times 0.0445) + 2.7971
= 10.2526 \text{ years}

Story5 (Page 56-57)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029
= (9.5 \times 0.0778) + (142 \times 0.0445) - 2.2029
= 4.2917

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971
= (9.5 \times 0.0778) + (142 \times 0.0445) + 2.7971
= 9.2917 \text{ years}

Spache Readability Index

Story1 (Page 2-3)

Grade Level = (0.141 \times L) + (0.086 \times N) + 0.839
= (0.141 \times 4.9) + (0.086 \times 1) + 0.839
= 1.6158
Story 2 (Page 12-13)

Grade Level = \((0.141 \times L) + (0.086 \times N) + 0.839\)

\[=(0.141 \times 11.5) + (0.086 \times 9) + 0.839\]

\[=3.234\]

Story 3 (Page 22-23)

Grade Level = \((0.141 \times L) + (0.086 \times N) + 0.839\)

\[=(0.141 \times 9.6) + (0.086 \times 4) + 0.839\]

\[=2.5366\]

Story 4 (Page 46)

Grade Level = \((0.141 \times L) + (0.086 \times N) + 0.839\)

\[=(0.141 \times 6.35) + (0.086 \times 8) + 0.839\]

\[=2.422\]

Story 5 (Page 56-57)

Grade Level = \((0.141 \times L) + (0.086 \times N) + 0.839\)

\[=(0.141 \times 9.5) + (0.086 \times 7) + 0.839\]

\[=2.518\]

Flesch Human Interest

Story 1 (Page 2-3)

Human Interest = \(3.635pw + 0.314ps\)
\[
69 = (3.635 \times 13) + (0.314 \times 59) \\
= 65.781
\]

**Story 2 (Page 12-13)**

Human Interest = $3.635pw + 0.314ps$ 

\[
= (3.635 \times 6) + (0.314 \times 59) \\
= 40.336
\]

**Story 3 (Page 22-23)**

Human Interest = $3.635pw + 0.314ps$ 

\[
= (3.635 \times 17) + (0.314 \times 59) \\
= 80.321
\]

**Story 4 (Page 46)**

Human Interest = $3.635pw + 0.314ps$ 

\[
= (3.635 \times 20) + (0.314 \times 59) \\
= 91.226
\]

**Story 5 (Page 56-57)**

Human Interest = $3.635pw + 0.314ps$ 

\[
= (3.635 \times 10) + (0.314 \times 59) \\
= 54.876
\]
Read With Us Class 2

<table>
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<th>Page</th>
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<th>Average number of words per sentence (sl.)</th>
<th>% of difficult words.</th>
<th>Number of personal words.</th>
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<td>58-59</td>
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<td>21</td>
<td>54</td>
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Table 6
This is for the first 100 words.

Flesch Reading Ease

Story 1(Page 12-13)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 x 137) - (1.015 x 4.54)

= 86.327

Story 2(Page 24-25)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 x 133) - (1.015 x 6.6)

= 81.618
Story 3 (Page 34-35)
Reading Ease = 206.835 - 0.846wl - 1.015sl
= 206.835 - (0.846 \times 140) - (1.015 \times 7.74)
= 80.537

Story 4 (Page 58-59)
Reading Ease = 206.835 - 0.846wl - 1.015sl
= 206.835 - (0.846 \times 129) - (1.015 \times 6.25)
= 91.357

Average Reading Ease = \frac{\sum n}{x} = \frac{339.839}{4}
= 84.96

Powers-Sumner - Kearl

Story 1 (Page 12-13)
Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

= (4.54 \times 0.0778) + (137 \times 0.0445) - 2.2029
= 4.3836

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

= (4.54 \times 0.0778) + (137 \times 0.0445) + 2.7971
= 9.38 years

Story 2 (Page 24-25)
Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029
Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

=(6.6 \times 0.0778) + (133 \times 0.0445) + 2.7971

= 4.3611 years

Story 3 (Page 34-35)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

=(7.74 \times 0.0778) + (140 \times 0.0445) - 2.2029

= 4.769

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

=(7.74 \times 0.0778) + (140 \times 0.0445) + 2.7971

= 9.769 years

Story 4 (Page 58-59)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

=(6.25 \times 0.0778) + (129 \times 0.0445) - 2.2029

= 4.152

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

=(6.25 \times 0.0778) + (129 \times 0.0445) + 2.7971

= 9.152 years
Average Grade Level = \( \frac{\sum n}{x} = \frac{17.6657}{4} \)
\[ = 4.416 \]

Average Reading Age = \( \frac{\sum n}{x} = \frac{37.661}{4} \)
\[ = 9.41 \]

**Spache Readability Index**

**Story 1 (Page 12-13)**

Grade Level = \((0.141 \times L) + (0.086 \times N) + 0.839\)
\[ = (0.141 \times 4.54) + (0.086 \times 5) + 0.839 \]
\[ = 1.909 \]

**Story 2 (Page 24-25)**

Grade Level = \((0.141 \times L) + (0.086 \times N) + 0.839\)
\[ = (0.141 \times 6.6) + (0.086 \times 2) + 0.839 \]
\[ = 1.9416 \]

**Story 3 (Page 34-35)**

Grade Level = \((0.141 \times L) + (0.086 \times N) + 0.839\)
\[ = (0.141 \times 7.74) + (0.086 \times 2) + 0.839 \]
\[ = 2.10 \]
Story 4 (Page 58-59)

Grade Level = (0.141\times L) + (0.086\times N) + 0.839

= (0.141\times 6.25) + (0.086\times 2) + 0.839

= 1.892

Average Grade Level = \frac{\sum n}{x} = \frac{7.8426}{4}

= 1.96

Flesch Human Interest

Story 1 (Page 12-13)

Human Interest = 3.635pw + 0.314ps

= (3.635\times 12) + (0.314\times 54)

= 60.576

Story 2 (Page 24-25)

Human Interest = 3.635pw + 0.314ps

= (3.635\times 20) + (0.314\times 54)

= 89.656

Story 3 (Page 34-35)

Human Interest = 3.635pw + 0.314ps

= (3.635\times 11) + (0.314\times 54)

= 56.941
Human Interest = \(3.635pw + 0.314ps\)

\[= (3.635 \times 21) + (0.314 \times 54)\]

\[= 93.291\]

Average Human Interest = \(\frac{\sum n}{x} = \frac{300}{4}\)

\[= 75.116\]

### Read and Write English 2

<table>
<thead>
<tr>
<th>Page</th>
<th>Number of syllables (wl.)</th>
<th>Average number of words per sentence (sl.)</th>
<th>% of difficult words</th>
<th>Number of personal words.</th>
<th>Number of personal sentences.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>116</td>
<td>6.3</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>115</td>
<td>1.14</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>122</td>
<td>8.08</td>
<td>4</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Table 7

This is for the first 100 words.

### Flesch Reading Ease

Story 1 (Page 22)

Reading Ease = \(206.835 - 0.846wl - 1.015sl\)

\[= 206.835 - (0.846 \times 117) - (1.015 \times 6.5)\]

\[= 102.1015\]
Story 2 (Page 36)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 \times 115) - (1.015 \times 11.14)

= 98.2379

Story 3 (Page 88)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 \times 122) - (1.015 \times 8.08)

= 96.64

Powers-Sumner - Kearl

Story 1 (Page 22)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

=(6.5 \times 0.0778) + (116 \times 0.0445) - 2.2029

= 3.5808

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

=(6.5 \times 0.0778) + (116 \times 0.0445) + 2.7971

= 8.5808 years

Story 2 (Page 36)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

=(11.14 \times 0.0778) + (115 \times 0.0445) - 2.2029

= 3.8963
Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

= (11.14 \times 0.0778) + (115 \times 0.0445) + 2.7971

= 8.8963 \text{ years}

Story3 (Page 88)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029

= (8.08 \times 0.0778) + (122 \times 0.0445) - 2.2029

= 3.9767

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971

= (8.08 \times 0.0778) + (122 \times 0.0445) + 2.7971

= 8.9767 \text{ years}

Spache Readability Index

Story1 (Page 22)

Grade Level = (0.141 \times L) + (0.086 \times N) + 0.839

= (0.141 \times 6.5) + (0.086 \times 5) + 0.839

= 2.8155

Story1 2 (Page 36)

Grade Level = (0.141 \times L) + (0.086 \times N) + 0.839

= (0.141 \times 11.14) + (0.086 \times 5) + 0.839

= 2.876
Grade Level = (0.141L) + (0.086N) + 0.839

= (0.141 \times 8.08) + (0.086 \times 4) + 0.839

= 2.2122

English Aid Standard 2

<table>
<thead>
<tr>
<th>Page</th>
<th>Number of syllables (wl)</th>
<th>Average number of words per sentence (sl)</th>
<th>% of difficult words</th>
<th>Number of personal words</th>
<th>Number of personal sentences</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-61</td>
<td>119</td>
<td>16.5</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>62-63</td>
<td>140</td>
<td>8</td>
<td>13</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Table 7

This is for the first 100 words.

Flesch Reading Ease

Story 1 (Page 60-61)

Reading Ease = 206.835 - 0.846wl - 1.015sl

= 206.835 - (0.846 \times 119) - (1.015 \times 16.5)

= 89.4135
Powers-Sumner and Kearl

Story 1 (Page 60-61)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029
= (16.5 \times 0.0778) + (119 \times 0.0445) - 2.2029
= 4.4953

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971
= (16.5 \times 0.0778) + (199 \times 0.0445) + 2.7971
= 9.4953 years

Story 2 (Page 62-63)

Grade Level = (L \times 0.0778) + (N \times 0.0445) - 2.2029
= (8 \times 0.0778) + (140 \times 0.0445) - 2.2029
= 4.7895

Reading Age = (L \times 0.0778) + (N \times 0.0445) + 2.7971
= (8 \times 0.0778) + (140 \times 0.0445) + 2.7971
= 9.7895 years
Spache Readability Index

Story 1 (Page 60-61)

Grade Level = (0.141 × L) + (0.086 × N) + 0.839

= (0.141 × 16.5) + (0.086 × 3) + 0.839

= 3.4

Story 2 (Page 62-63)

Grade Level = (0.141 × L) + (0.086 × N) + 0.839

= (0.141 × 16.5) + (0.086 × 13) + 0.839

= 3.076
# Summary

## Class 5 English Books

<table>
<thead>
<tr>
<th>Book</th>
<th>Flesch Reading Ease</th>
<th>Powers-Sumner - Kearl's Grade level</th>
<th>Powers-Sumner - Kearl's Reading Age</th>
<th>Spache's Grade Level</th>
<th>Flesch's human Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary English</td>
<td>78</td>
<td>5</td>
<td>10</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>New Progressive English</td>
<td>81.3</td>
<td>6</td>
<td>10</td>
<td>3</td>
<td>51</td>
</tr>
<tr>
<td>Read and Write</td>
<td>83.29</td>
<td>5</td>
<td>10</td>
<td>4</td>
<td>Low</td>
</tr>
<tr>
<td>English Aid</td>
<td>75.52</td>
<td>5</td>
<td>10</td>
<td>4</td>
<td>Low</td>
</tr>
</tbody>
</table>

Table 8
## Class 2 English Books

<table>
<thead>
<tr>
<th>Book</th>
<th>Flesch Reading Ease</th>
<th>Powers-Sumner-Kearl's Grade Level</th>
<th>Powers-Sun-Kearl Reading Age</th>
<th>Spache's Grade Level</th>
<th>Flesch Human Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read with Us</td>
<td>84.96</td>
<td>4</td>
<td>9</td>
<td>2</td>
<td>75.1</td>
</tr>
<tr>
<td>New Progressive English</td>
<td>76.85</td>
<td>5</td>
<td>10</td>
<td>3</td>
<td>69.42</td>
</tr>
<tr>
<td>Read and Write English Aid</td>
<td>96.89</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>84.84</td>
<td>5</td>
<td>10</td>
<td>3</td>
<td>Low</td>
</tr>
</tbody>
</table>

Table 9
4.1.1 Interpretation of tables.

The Reading Ease score is translated into school grades as follows. Reading matter with the score shown on the left side will be easy for students on the level shown on the right.

<table>
<thead>
<tr>
<th>Score</th>
<th>School level</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>5th grade</td>
</tr>
<tr>
<td>80-90</td>
<td>6th grade</td>
</tr>
<tr>
<td>70-80</td>
<td>7th grade</td>
</tr>
<tr>
<td>60-70</td>
<td>8th and 9th grade</td>
</tr>
<tr>
<td>50-60</td>
<td>10th to 12th grade</td>
</tr>
<tr>
<td>30-50</td>
<td>college</td>
</tr>
<tr>
<td>0-30</td>
<td>college graduate</td>
</tr>
</tbody>
</table>

**Interpretation of Human Interest Formula**

- 0-40  Dull
- 40-60 Interesting
- 60-80 Very Interesting
- 80-100 Dramatic

The results above are discussed in the next chapter-Discussion.
### 4.2 Legibility

#### Class 5

<table>
<thead>
<tr>
<th>Book</th>
<th>Font</th>
<th>Size</th>
<th>Spacing/Leading</th>
<th>Length</th>
<th>Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary English</td>
<td>Times Roman</td>
<td>12</td>
<td>0&quot;</td>
<td>10-12 d</td>
<td>Justified</td>
</tr>
<tr>
<td>New Progressive English</td>
<td>Times Roman</td>
<td>14</td>
<td>1.5&quot;</td>
<td>10-12</td>
<td>Left/flush Rugged</td>
</tr>
<tr>
<td>Read and Write</td>
<td>Times Roman</td>
<td>10</td>
<td>0&quot;</td>
<td>14-16</td>
<td>Justified</td>
</tr>
<tr>
<td>English Aid</td>
<td>Times Roman</td>
<td>10</td>
<td>0&quot;</td>
<td>14-16:</td>
<td>Justified</td>
</tr>
</tbody>
</table>

**Table 10**
Class 2

<table>
<thead>
<tr>
<th>Book</th>
<th>Font</th>
<th>Size</th>
<th>Spacing/Leading</th>
<th>Length of line</th>
<th>Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Progressive English</td>
<td>Arial</td>
<td>16</td>
<td>1.5&quot;</td>
<td>7-8</td>
<td>Left Aligned</td>
</tr>
<tr>
<td>Read with Us</td>
<td>Times Roman</td>
<td>16</td>
<td>1.5&quot;</td>
<td>6-7</td>
<td>Left/rugged</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Centered dialogues)</td>
</tr>
<tr>
<td>Read and Write</td>
<td>Times Roman</td>
<td>16</td>
<td>1.5&quot;</td>
<td>12-13</td>
<td>Justified</td>
</tr>
<tr>
<td>English Aid</td>
<td>Arial</td>
<td>14</td>
<td>1.5&quot;</td>
<td>10-12</td>
<td>Justified</td>
</tr>
</tbody>
</table>

**Table 11**

The results show that class two books are written in both Arial and Times Roman. However, research by Davis K. et. al. (2001) indicates that Arial was discriminated and identified better than Times Roman, by children Gilliland (1975:30) also recommends Arial for children's texts. Point sizes of 16 are legible enough. The spacing was within the safety zones of primary school texts. That is average of 7-12 average words. Regarding alignments, the core and supplementary book were left aligned (i.e. where the right-hand edge of the text is not straight). This is better because such alignments
help the reader’s eye to scan the lines more accurately. Justified lines tire the eyes and make the writing appear serious. (Tinker: 1963)

### 4.3 Illustrations

#### Class Five

<table>
<thead>
<tr>
<th>Textbook</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary English</td>
<td>Sombre and realistic. Uses only one colour</td>
</tr>
<tr>
<td></td>
<td>Relevantly and adequately illustrated.</td>
</tr>
<tr>
<td>New Progressive English</td>
<td>Bright realistic pictures.</td>
</tr>
<tr>
<td></td>
<td>Relevantly and adequately illustrated.</td>
</tr>
<tr>
<td>Read and Write</td>
<td>Sombre realistic pictures. Very few</td>
</tr>
<tr>
<td></td>
<td>Illustrations.</td>
</tr>
<tr>
<td>English Aid</td>
<td>No illustrations.</td>
</tr>
</tbody>
</table>

**Table 12**
New Progressive English | Bright realistic pictures
Adequately illustrated.
---|---
Read With us | Bright realistic pictures.
Adequately illustrated.
---|---
Read and write | Dull realistic pictures
Scarcely illustrated. Dull realistic picture
---|---
English Aid | Bright, realistic, and well illustrated.

Table 13

Note

- Adequate illustration implies that over 75% of the stories in the book are illustrated.
- Scarcely illustrated implies that less than 50% of the stories are illustrated while well illustrated implies that half the stories in the book are illustrated.
- Bright and sombre are used to refer to colours.
- Realistic pictures are those that look like real life pictures, while abstract pictures are those that are cartoon-like drawings.

4.5 Teachers’ opinion on the readability of the books under study

Teachers interviewed showed that they evaluated the readability of texts using comprehension tests and observation of the student behaviour. They also assessed vocabulary, length of passages and the general layout of the books. However, this was in as far as the book complied with the specifications of the syllabus.
For class 2, the teachers generally observed that longer essays like those found in *New Progressive book two* (over 200 words) caused comprehension difficulty to pupils. They observed that pupils at this level had short memory spans. Teachers therefore preferred short passages found in *Read and Write* or *English Aid*. They have passages of less than 200 words.

Teachers also noted that illustrations, especially bright and realistic pictures such as those found in *Read with Us* by K.I.E were not only significant in aiding comprehension but also in reinforcing interest. Most learners relied on illustrations to interpret texts. This supports the dual coding theory, which says that information, is comprehended and easily remembered when dual coded, that is verbally and visually.

Bigger fonts, 12 and above was reported as the one favoured by most learners. This is particularly evident during library lessons when various books with different fonts are given to pupils. Most pupils ignore texts with small fonts of 10 and below even if they have interesting stories. Learners also liked the flush left aligned compared to the serious looking justified alignment as is the case in *Read and Write*.

The teachers generally observed that their pupils in class 2 liked narratives especially animal stories and adventure.

However, there were disparities between schools. While at Ulalo, a rural school, the teachers found the *New Progressive English* for class 2 difficult for her pupils. The
teacher at Shady Garden said her learners found it easy. In fact, she noted that right from first term her pupils could read the book and comprehend it. The teachers at Joel Omino had the same complaint as those at Ulalo. They observed that their pupils could hardly speak in English or read it well. They attributed the problem to other factors such as poor Pre-school (nursery school) learning, lack of books and less out of school reading. This was in congruence with earlier reading research, which shows that home cognitive stimulations play significant role in a Child’s reading achievement. Children from middle class families have opportunities to learn how to read from the televisions and computers. Their parents can also afford to buy them storybooks and magazines that they read at home. They are also tutored and assisted in reading by family members or even by hired specialists. Therefore, when they go to school they are equipped with rich background knowledge (of content and format) as purported in the Schema Theory.

The reactions to the class 5 books were different. All schools noted that Primary English Book 5 was average in terms of difficulty. Notably, the story about taking a photograph (pg 96-97) was pointed out as difficult in all the schools. This evaluation was based on pupils’ response to questions from the story.

Legibility and illustrations were found to be adequate. This was in spite of the books having been written in Times Roman and having sizes as small as 10. Teachers from the working class urban school found class 5 Primary English average in terms of level of difficulty.
The study revealed that teachers' choice of supplementary books was heavily based on the kind of exercises it had in it. For this matter, *Read and Write* and *English Aid*, in spite of lacking on other fronts were the teachers' favorites. Another was that they are lowly priced, therefore affordable.
CHAPTER FIVE

5.0 DISCUSSION

The Reading Ease scores showed that the class 5 books were tough for the recommended level. It showed that they were suitable for class 6 and 7. As had been mentioned earlier this formula was designed for adult material. It looks at word and sentence length to determine reading grade levels. This formula was used because it aids in calculating the human-interest score, which was an aspect of this study.

Sumner-Powers - Kearl showed that the books were suitable for grade 5 except for *New Progressive English* (Supplementary book), which was found to be suitable for Grade 6. The Grade levels range from 1 – 12. Translated to the Kenyan system, Grade 1 is equivalent to Class 1 while Grade 12 is equivalent to Form 4. The class 5 books were found to be suitable for pupils of 10 years of age. In the Kenyan context most pupils enter class one at 6-7 years of age. This means that 10 year olds are pupils in class 4 and 5.

The Spache formula, which uses a standard list to identify difficult words, found the class 5 books suitable for class 3 and 4. It found the core and supplementary books simple in terms of vocabulary. It ranks them as suitable for class 3, while popular books are ranked to be suitable for class 4.
These differences point out very significant facts. They show that though the books are appropriate in terms of word length and sentence length, the words used in them are normally very simple everyday words. However, it should be noted that occasional use of unfamiliar words in a story not only enriches the pupils' vocabulary but also creates a reading interest in them.

Another possible cause of the difference in finding is that, in Kenya English is a second language. Most learners at the Primary level have not acquired sufficient word bank. Majority of them are actually deficient in even the familiar words in the Spache word list. Therefore, locally written books have just to be in simple everyday English. That is, the writers must take the Kenyan pupil's schemata into consideration.

The human-interest scores for class five-core book showed that it is a dull book while the supplementary book (**New Progressive Primary English**) proved to be fairly interesting. This means that when the subject matter and contextualization were controlled, stories still varied in the manner in which personal words and personal sentences are used. Flesch, who came up with this formula said that any written word could be interesting as long as the writer uses more of a conversational tone, dialogue, names e.t.c.

The books had stories with local and familiar settings. They were culturally and religiously appropriate. The Presentation was gender sensitive.
The popular books were generally very dull. They had few personal words as few as two. There were also very few personal sentences. *(English Aid* pg 69-70)

**CLASS TWO BOOKS**

The Reading Ease score showed that the core book was suitable for Grade 7 while the supplementary book was suitable for class 6. The reason for this great difference between what the formula finds and what the publishers recommend is as discussed for class 5.

Powers-Sumner and Kearl found the core book and the supplementary books to be suitable for class 5 and 4 respectively and that they suited pupils of 9 – 10 years. This supports the teachers’ view that the core book was fairly difficult. It had long sentences and words. Generally, it had long stories. The two popular books were also found to be one to two levels above the recommended levels.

The Spache formula which looks into the occurrence of difficult words also found the class 2 books suitable for class 3 except for *Read and Write*-the supplementary book which was found suitable for its recommended level. The core book and the supplementary books were found to be interesting; they had good dialogues and frequent use of personal words.

In conclusion, the class 5 books evaluated in this study were found to be suitable for their grade level or class but were deficient in terms of vocabulary. They were
also found to be dull. The class 2 books were found to be difficult for the recommended level.

It is important to note that the reading level predicted by a readability test is the "break off" point for a reader of that reading age. That is, a reading age of 10 predicts that an average 10 year old would be at the limit of his/her reading comprehension ability with that book. This is because most readability formulas are based on a 50% correct answer score in a comprehensive test. Readability formulas cannot be the sole measurement of the suitability of a test. Other factors such as the type, size of type, the use of illustrations and colour and layout were also considered.

The class five core book and supplementary books were found to be suitable in terms of type, size, illustrations and colour. However, the popular books were found to be insufficient in terms of illustrations and colour. They were dull in this regard. According to the Dual Coding Theory, this hindered comprehension. They were also found to have small font sizes and the books were of poor paper quality.

The class two core and supplementary books were well illustrated. They were also legible in terms of font size and type. The illustrations were gender sensitive except for the supplementary book, which had the stereotype roles e.g. male carpenters, male drivers, and female housewives e.t.c.

The popular books had dull illustrations with only one colour. The type sizes were all right.
This study investigated the readability of selected class two and class five English course books used in Kenya today. This was done using readability formulas. It also looked into the legibility of print and illustrations. The study also sought the teachers' opinions on the above books.

This study was grounded in the schema theory and the Dual Coding Theory. The study looked into texts' characteristics such as sentence length, word length and vocabulary. It also looked into graphic details such as fonts, type sizes, alignments and spacings. The study also assessed illustrations. All these were done with a view to finding out how they influenced the readability of these books.

The significant finding of this study was that class two books were found to be difficult for the recommended level. The class five books were found to be containing very simple vocabulary that is below that grade level.

This study generally focused on the different contributions that each text characteristic makes to the child's reading achievement. However, it is evident that text comprehension takes more than just this. Factors such as individual characteristic, time, home and school environment all play significant roles in learners' reading ability. Therefore they should be investigated.
This study has implications for panels that select books to be used in schools. The methodology and findings of this study could help improve the quality of their vetting.
Appendix I

QUESTIONNAIRE

SCHOOL________________________________________

CLASS________________________________________

NAME OF TEACHER (optional)______________________

QUALIFICATION OF TEACHER______________________(S1, P1, etc)

YEARS IN SERVICE______________________________

Please, read the passages below and comment on their levels of difficulty with regard to your pupils reading abilities.

(Comments: (i) very easy (ii) easy (iii) average (iv) difficult (v) very difficult

CORE BOOK: TITLE_________________________________

<table>
<thead>
<tr>
<th>Passage</th>
<th>Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Tick as is appropriate)</td>
<td></td>
</tr>
<tr>
<td>(a) Page________________</td>
<td>(i) (ii) (iii) (iv) (v)</td>
</tr>
<tr>
<td>(b) Page________________</td>
<td>(i) (ii) (iii) (iv)</td>
</tr>
<tr>
<td>(v)</td>
<td></td>
</tr>
<tr>
<td>(c) Page________________</td>
<td>(i) (ii) (iii) (iv) (v)</td>
</tr>
<tr>
<td>(d) Page________________</td>
<td>(i) (ii) (iii) (iv) (v)</td>
</tr>
</tbody>
</table>

SUPPLEMENTARY BOOK: _____________________________

<table>
<thead>
<tr>
<th>Passage</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Page________________</td>
<td>(i) (ii) (iii) (iv) (V)</td>
</tr>
<tr>
<td>(b) Page________________</td>
<td>(i) (ii) (iii) (iv) (v)</td>
</tr>
<tr>
<td>(c) Page________________</td>
<td>(i) (ii) (iii) (iv) (v)</td>
</tr>
<tr>
<td>(d) Page________________</td>
<td>(i) (ii) (iii) (iv) (v)</td>
</tr>
</tbody>
</table>
2. How do you evaluate the difficulty of the comprehension passages/books that you use?

(a) By using a readability formula.

(b) By use of a test.

(c) By use of observation.

(d) By use of ______________________ (Give what you use)

(e) I don’t evaluate the difficulty of passages or text that I use.

3. Do you choose/or have a say in choosing what other book (a part from the core textbook) to be used to teach reading in your class?

(a) Yes.

(b) No.

4. If yes, what do you mainly consider before making a choice?

(a) The level of difficulty of the text.

(b) The fact that it has been used before by learners of equivalent level.

(c) The fact that it has comprehension exercises and answers.

(d) Any other. (Give your answer)
5. Briefly comment on the reading ability of your learners with regard to each of the texts below:

<table>
<thead>
<tr>
<th>Text</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Very poor</td>
<td>(i) (ii) (iii) (iv)</td>
</tr>
<tr>
<td>(ii) poor</td>
<td>(i) (ii) (iii) (iv)</td>
</tr>
<tr>
<td>(iii) Good</td>
<td>(i) (ii) (iii) (iv)</td>
</tr>
<tr>
<td>(iv) Very</td>
<td>(i) (ii) (iii) (iv)</td>
</tr>
</tbody>
</table>

1. _______________________________
2. _______________________________
3. _______________________________
CHECK LIST

1. Legibility of print

The factors affecting speed and comprehension have been extensively researched. However, due to the large number of variables, the conclusions are sometimes ambiguous. Some of the conclusions, which are directly linked to this study, are summarized here, but more information can be found in the monographs by Gilliland (1972) and Watts and Nisbet (1974).

(a) The type

- Lower case print is preferred by most readers and is read about 10% faster than words in capital letters:
  - [ ] Lower case.
  - [ ] Capital letters.

- For single letters (e.g. labels on diagrams) titles/headings, capital letters are more easily differentiated.

- Ariel is discriminated and identified better than Times New Romans (serif).
  - [ ] Arial.
  - [ ] Serif.

- When emphasis is required, bold type is read more quickly than italics or capitals.

- A fluent reader relies upon the upper coastline of the print for most of his information. In addition, the right-hand side of letters gives more information than the left.
(b) The layout

There are 4 interrelated factors here:

i. The size type.

ii. The length of line.

iii. The spacing between lines.

iv. The weight of print.

◆ If the size of type or length of line is changed, then the heading should be altered to maintain efficient eye movements.

◆ 10 point, 11 point and 12 point type seem to be the best sizes for fluent readers. For kindergarten to class 2 readers larger fonts upto 24 point are used.

◆ At the normal reading distance of 35cm, 10 point size brings 4 letters within the focal area and 20 letters within a 5-degree of field view.

◆ Lines, which are too short or too long cause inefficient eye movements. When considering the speed of reading, researchers have recommended line lengths in the range 6-9cm (depending on the size of type and leading). An A4 worksheet may have lines of 18cm. Overall, line lengths of 7-12 average words seem to be optimum.
Unjustified lines (that is, where the right-hand edge of the text is not straight are better, because they help the readers’ eye to scan the lines more accurately.

White space (between paragraphs), and subheads helps for the same reason.

(c) The reading conditions

- Serious effects on legibility arise when vibration occurs with a hand-held book and when the line of vision is not at right angles to the plane of the page. Books with thick spines may cause difficulty due to the curvature of the page, particularly where the umer (gutter) margin is narrow. Strong illumination may help here, by causing the pupil of the eye to contract, reducing spherical aberration and giving a greater depth of focus.

- The size of margin does not seem to affect the speed of reading, but may cause increased eye fatigue if it is too narrow. Matt paper causes less eye fatigue than glossy paper. The paper should be thick enough to prevent print on reverse side showing through.

- Black type on white paper (or a white screen) is more legible than any other colour combination. Blue, red and green on white are often acceptable. The worst combination is black type on a purple background.
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