DETERMINANTS OF READING COMPREHENSION PERFORMANCE AMONG FORM THREE LEARNERS IN ISINYA SUB-COUNTY IN KAJIADO KENYA

BY

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY

IN THE DEPARTMENT OF LITERATURE, LINGUISTICS, FOREIGN LANGUAGES AND FILM STUDIES

SCHOOL OF ARTS AND SOCIAL SCIENCES

MOI UNIVERSITY

2022

DECLARATION

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DEDICATION

This thesis is dedicated to my family my husband Theuri, our lovely children Gikunju, Nyaruai and Wanjiku whose love and understanding has been enduring. To you all you are truly cherished for without you, I could not have accomplished this feat.

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to my two supervisors Dr. Janna Aanstoot and Dr. J. N. Ogutu for their tireless supervision, intellectual stimulation, advice and guidance which facilitated the timely completion of this thesis. I express my gratitude to Dr. Evelyne Kisembe for her tireless follow-up, motivation and inspiration despite her busy schedule I could not afford to let you down Doctor.

I thank the head teachers, teachers and form three learners of Moi girls Isinya and Noonkopir girls, for their support and cooperation. Finally, but not least, special thanks go to my friend Esther for taking time to proof read my work and check on the references God bless you all.

ABSTRACT

Reading comprehension activities are important techniques in enhancing reading comprehension skill among learners. Defined as deliberate conscious techniques, these activities are essential in assisting one's reading process giving a clear sense of direction on comprehending while reading, helping a learner overcome language deficiency, achieve better reading comprehension, prevent failure of comprehension and support interpretation of the text. Form three English language syllabus recommend the use of reading comprehension skill activities during the reading comprehension lessons. Evidence from the Kenya National Examination Council (KNEC) reports indicate that learners are experiencing challenges in the area of English comprehension. KNEC attributes the poor performance in reading comprehension of passages to inadequate and/or lack of the reading comprehension skill activities during the reading comprehension lessons. This study therefore, examined the extent to which reading comprehension skill activities predict and correlate with reading comprehension performance of form three learners. In addition, the study examined the meanings of erroneous answers obtained from reading comprehension assessment passages. The reading comprehension activities were: previewing, prediction, semantic mapping, inference making, note-making, paraphrasing, summary writing, question posing and group discussion. The study adopted an experimental mixed method approach by randomly selecting seventy-three form three learners from two Peri-urban girls' schools in Kajiado County, Kenya. Data was collected by administering of comprehension activities to the experimental group whose schemata was analyzed using the Schema theory. Quantitative data was analyzed using Pearson's Correlation Coefficient, t-test, ANOVA, Multiple Regression Analysis tests at p <0.05 level of significance. Results revealed significant statistical differences in mean score between the control group and experimental group post-test performance (t=11.05, df =71, p<.00). Previewing (r=.352, n=39, p=.028), prediction (r=.531, n=39, p=.001), semantic mapping (r=.330, =39 p=.40) and inference making (r=.457, n=39, p=.003) had a significant correlation with reading comprehension performance of the experimental group and not for control group. Prediction (β=.473, t=4.763, p= 000), inference making (β=.75, t=4.1, p=.00) and discussion skills (β=.41, t=3.44, p<.002) significantly predicted the reading comprehension performance of experimental group but not for control group. Learners made errors at various levels. The study concluded that lower–level reading word recognition namely, phonological awareness, orthography, morphology, collocational and semantic vocabulary knowledge; coupled with adequate activation of background knowledge for high-level knowledge comprehension processes are required in a learner for construction of coherent mental representation of a text. The study recommends that reading comprehension skill activities of inference making, prediction and group discussion integrated with continuous learning of lower-level reading knowledge processes and adequate vocabulary knowledge processes should be continually exposed to the learners.

DEFINITION OF TERMS

Content schemata knowledge about the subject matter of a text or message of the text.

Formal schemata knowledge about the structure of a text

Linguistic schemata the knowledge of the letters and their corresponding sounds both alone and in their clusters and the ability to predict through knowledge of syntax, the word or words that will follow

Reading comprehension a cognitive process of simultaneously extracting and constructing meaning through interaction and involvement with written text and readers' previous knowledge

Reading comprehension skill activities are deliberate, conscious practices that readers employ to enhance their comprehension or retention of textual information

Reading comprehension erroneous answers phonological, orthographical, morphological, syntactic, and lexical forms that deviate from the rules of the target language realized in writing.

Prior Knowledge For the purpose of this study, prior knowledge has been conceptualized as the knowledge the learner has on a particular topic before reading a comprehension passage

Schemata Readers' background cognitive structures or knowledge already stored in the memory.

LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
ESL	English as Second Language
EFL	English as a Foreign Language
ESLL	English Second Language Learner
K.C.S. E	Kenya Certificate of Secondary School
K.I.C. D	Kenya Institute of Curriculum Development
K.N.E.C	Kenya National Examination Council
L_1	First language
L_2	Second language
L o I	Language of Instruction
LQH	Lexical Quality Hypothesis
NACOSTI	National Commission for Science, Technology and Innovation
N.A.E. P	National Assessment of Educational Progress
NHFL	The National Institute of Literacy
TL	Target Language

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

This study falls in the broad area of learning and teaching English as a second language (ESL), specifically in ESL reading comprehension. It was conducted to examine whether a set of reading comprehension skill activities namely: previewing, prediction, semantic mapping, inference making, note-making, paraphrasing, summary writing, question posing and group discussion had a significant correlation and predictive value on reading comprehension performance of English reading comprehension passages. It also sought to examine the meaning of erroneous answers obtained from reading comprehension assessment passages. This chapter therefore, provides background information to the study, statement of the problem, research objectives, research questions, research hypotheses, assumptions of the study, rationale of the study, scope of the study and limitations of the study.

1.2 Background to the Study

Reading is not an easy process, but a complex, multiple-component skill that call for an intricate combination of many lower and higher-level cognitive linguistic, non-linguistic skills and sub-skills. Since reading involves different skills and language sources, an examination of some of these components is crucial in understanding how second language (L2) reading comprehension occurs (Nassaji, 2014).

The National Institute of Literacy (NHFL, 2007) define reading as:

> *A complex system of deriving meaning from the print that requires all of the following: the skill and knowledge to understand how phonemes or speech sounds are connected to print; the ability to decode unfamiliar words; the ability to read fluently; sufficient background information and vocabulary to foster reading comprehension; the abilitiesto construct meaning from prints and the development of maintenance of motivation to read (p.1)*

Second language (L2) reading research and practice has increased intensely in the past two decades. Much of this attention is due to the increasing acknowledgement that reading abilities are vital for academic learning and that L_2 reading represents the principal way that L_2 learners can learn on their own beyond the classroom. Moreover, there is an increasingly appreciation that we all live in a multilingual and multi-cultural world, one that is becoming interconnected through global media and the new global economy.

There are three major levels of reading processing that a reader engages in reading that need recognition in the definition. The first phase of linguistic processing is at the phonological, morphological, syntactic, lexical, semantic and discourse levels. It is not possible to read without making graphemic-phonemic connections, without recognizing the words to read and the structural phrases organizing the words and without having a reasonable store of linguistic knowledge (morphological, syntactic and semantic) of the language of the text. Reader must recognize the phonological, orthographic and semantic representations of individual words and connect these representations to form understanding of the underlying meaning of the sentence The processing of linguistic information is central to reading comprehension (Jiang, 2020).

At the second level, a reader engages in a comprehension building phase of processing. This engagement involves text-summary writing, inferencing from knowledge sources, monitoring and assessing reading objectives, adjusting reading processes to enhance comprehension and restoring comprehension processes as needed.

At third level, the reader draws upon an impartially wide range of underlying general cognitive resources that include working memory, long-term memory abilities, motivation, goal setting among others (Grabe & Stoller, 2013).

With this more elaborate definition of reading process, it becomes apparent that developing fluent readers is a challenging task requiring much time, resources and effort. In addition, this definition makes the nature and development of L_2 reading complex. This study is situated at second phase of reading process where a reader engages in a comprehension building process in learning.

Reading comprehension is an interactive process in two ways; one, it combines various cognitive processes that work together at the same time; two, it is an interaction between the reader and the writer (Carlisle, 2010). The text offers information that the author intends the reader to comprehend in certain ways. The reader also brings variety of background knowledge to reading, actively constructs the meaning of the text by comprehending what the author needs and interprets the text in terms of the background knowledge activated by the reader.

The term reading comprehension in this study refers to a highly complex cognitive process of understanding a written linguistic message, which includes various important aspects such as recognizing symbols quickly and accurately, comprehending meaning implied by the author. It is viewed as the most crucial skill for English second language learners (ESLL) as it makes them gain exposure to the second language and receive valuable linguistic input to build up language proficiency. Reading comprehension is also a complex system of deriving meaning from the text, which involves skills like inference, guessing the meaning from the context, prediction, note-making, among others. These skills are either observable like note-making or unobservable like inferring. It is a skill acquired by the learners to make them achieve their reading goals.

The reading comprehension process involves interaction between the reader and the text

(Rapp et al., 2007). The role of the reader is to extract meaning from the text as the meaning does not exist in the text alone but lies in the interaction between the reader and the text (Alyousef, 2006). This helps the reader to see beyond the literal meaning of words in the text (Harmer, 2003). Strong comprehension of the text depends to a large extent on shared background knowledge between the reader and the text. The shared background knowledge of that has a crucial role in comprehending what is read (Pour-Mohammadi & Abidin, 2009). Analysis of the reading process raises awareness of the demands of different texts and the needs for comprehension instruction use to meet those demands (Klingner, 2004).To comprehend a text as a whole, the reader needs to process and link single idea units, resulting in building of a coherent mental representation of a text. For these processes to be effective, many factors play a role, including reader characteristics, text properties and the demands of the reading task (Edwards & Turner, 2011).

Some aspects of reading comprehension are decoding, which is a process needed to figure out written code which can be phonological or orthographically; automaticity which is a process of recognizing words and assigning meaning; structure meaning which is relating meaning to the experience; comprehension monitoring and analyzing text structure among others. In addition, it is a process which involves the integration of the ability on knowledge of vocabulary, grammar and sentence structure, previous knowledge of the topic and appropriate reading comprehension skill activities to interpret text for meaning-making (Pardo, 2004). In addition, reading comprehension is a complex and dynamic process in which the reader decodes the writer's words and draws from his background knowledge to construct understanding of the text that is similar to the writer's intent. It is also an interactive mental process between reader's linguistic

knowledge, knowledge of the world and knowledge about a given topic (Rahmani & Sadeghi, 2011).

Reading comprehension is the thinking process used to make meaning of what a person reads (McKown & Barnett, 2007). It is the process of understanding the texts that are read; it is the purpose for reading, it is also a pre-requisite for meaningful learning from the text (Kirby, 2007). The objective is to get understanding of the text rather than to understand the meaning of individual words or sentences. The outcome of a reading comprehension is the mental representation of a text that is combined with the readers' previous knowledge (Kintsch & van Dijk, 1978).

Gilakjani and Sabouri, (2016b) defined reading comprehension as the process of simultaneously extracting and constructing meaning through interaction and involvement with written language. Reading comprehension comprises three components: the reader, the text and the activity.

The reader brings to the process of reading his/her cognitive competences (memory, attention, critical analytical ability, inference, visualization); motivation (purpose for reading, interest in the content and self-effectiveness as a reader); knowledge of vocabulary and topic knowledge, linguistic and discourse knowledge; knowledge of reading comprehension activities; and experience. These qualities differ considerably among readers (inter-individual differences) and differ even within an individual reader as a function of a particular text and activity (intra- individual differences).

Text features have a large impact on comprehension during reading. The reader hypotheses have different representations of the text that are important for comprehension. These representations comprise the *surface code* (the exact words of the text), the text *base* (idea units representing the meaning of the text) and the *mental models*

(the way in which the information is processed for meaning) that are entrenched in the text.

The reading activity involves one or more purposes or tasks, some operations to process the text and outcome of performing the activity, all of which occur within some specific context. The initial purpose for the activity can change as the reader reads. That is, a reader may encounter information that raises new questions and make the original purpose insufficient or irrelevant.

Reading comprehension is a search for meaning, actively using our world knowledge and the text to understand new things we read. We need knowledge of the world to understand new things, we also need to be familiar with various text structure encountered and be active in seeking meaning from the reading comprehension passage (Gilakjani & Sabouri, 2016b).

In English second language settings, it is frequently argued that reading comprehension is the fundamental way of learning new information and is the most significant skill required for learners' academic success. Reading comprehension is fundamentally related to meaning, particularly with transfer of meaning from writer to reader (Mohammadi & Abidin, 2009).

Alyousef (2006) stated that reading comprehension relies on two kinds of information: that which is received from the text and that which is retrieved from the reader's memory. Reading comprehension can thus be defined as the capability to perceive and understand the meanings communicated by the text. Comprehension is the outcome of the interaction between background knowledge of the reader and the text (Zare & Othman, 2013).

Pressley, (2002) defined reading comprehension as a process of constructing a

supportable understanding of a text. Pressley pointed out two features of comprehension processing. First, comprehending a text as an active intentional thinking process and second, understanding as a variation in readers' background knowledge. Attaining mastery in second language reading comprehension can be a problematic process and many learners experience considerable difficulties in trying to do so (Küçükoğlu, 2013). Reading comprehension is a complex process that involves components and processes of improving learners understanding of a text. It is an interactive process of finding meaning from a text (Gilakjani & Sabouri, 2016a).

Menioado (2016) stated that reading comprehension is a series of cognitive activities that include a lot of dimensions like the understanding of words and their meanings, reactions and integration. It is the ability to get meaning from what is read that needs different skills such as word recognition, fluency, lexical knowledge and pre-existing knowledge to be undertaken quickly so that the reader gets knowledge form the text. It is a complicated process in which readers have an important role in making meaning from the text through applying existing reading skills (Gilakjani & Sabouri, 2016b).

To comprehend a text a reader should possess knowledge about his/her abilities, the purpose, the demands of the text he/she is reading as well as reading comprehension skills activities available for use in achieving reading comprehension (Murphy et al., 2009). Reading comprehension is different from oral comprehension and listening comprehension in that it is an application of skill that evolved for other purposes, to a new form of input (text).

(Kirby, 2007). Unlike listening comprehension, reading comprehension is not something our brains have evolved. Whereas oral comprehension seems to develop naturally with

minimal deliberate intervention, reading comprehension is more challenging and requires deliberate interventions.

An observation has been made that human have been accomplished in oral comprehension for 100,000 years or more and virtually all humans do it. Reading comprehension has only been practiced for 5,000 years, and for most of that time the majority of humans did not do it. The application of comprehension to text lifts our mental capacities. It is fundamental to full participation in society, now and for the foreseeable future (Dole et al., 1991).

In reading comprehension, the reader is supposed to draw information from a text and then combine it with information he/she has. Reading comprehension in second language is a complex process for second language learners because they must combine skills in order to understand a text (Abdollahzadeh & Jabbari, 2016).

There are different types of reading comprehension distinguished according to reader's purposes in reading and the type of reading. First the literal comprehension; this is reading in order to understand, remember or recall information explicitly contained in the reading text.

Second, is the information comprehension; this is reading in order to find information which is not explicitly stated in the text, using the reader's experience, intuition and by inferring. Third the critical and evaluative comprehension; this is reading in order to compare information in a text with the reader's own knowledge and values. Forth the appreciative comprehension; this is reading in order to gain an emotional or other kind of valued response from the text.

There are some features in the reading process that most researchers agree on. One of

them is what is in the readers' mind. People read different texts with different intentions (Kern, 2014). For example, reading a traffic sign and reading an academic text require different aims. Successful comprehension is achieved by having a purpose in mind for reading (Kirby, 2007). Two, the meaning of reading comprehension is to understand a written text. Good readers should be able to decode words, read fluently and have proficiency; however, this is not enough. Comprehension activities should be taught to learners by naming the reading comprehension activity, how it should be used, model through think-aloud process, partner practice and independent use of the activities (Küçükoğlu, 2013).

There are factors that influence second language reading comprehension. According to Ma and Lin (2015), one of them is vocabulary knowledge (word meaning) that has a primary role in reading comprehension. The reader must derive meaning from most words they encounter while reading a text. Vocabulary knowledge is viewed as an essential and accurate predictor of reading ability of a second language learner and it has an impact on comprehension ability. Ma and Lin (2015) claimed that second language learners have to achieve a vocabulary threshold of 3000-word families for effective comprehension. It is difficult for readers to understand a text if there are many unknown words in a text.

The second factor that influences reading comprehension is morphological, syntactic and semantic knowledge. Morphological knowledge involves understanding the structures of the language and making connections among words in sentences. For example, the learner needs to learn the forms that signal different word meanings for instance '-ed' form of verbs to denote past tense; forms that change word meaning such as the prefixes, in-, im-, un-, that make words negative and words that bring cohesion to a text, for example, however, therefore, nevertheless, among others (McKown & Barnett, 2007).

Syntactic knowledge plays an important function in the meaning construction and interpretation of the texts (Stahl & Vancil, 1986). This syntactic knowledge is significant because one can understand the meaning of a sentence plainly with the aid of grammatical structures and rules of syntax.

Semantic knowledge refers to word and sentence meanings. Readers who can tell the meaning of words and sentences easily and correctly are likely to comprehend text appropriately. Insufficient semantic access can be as a result of decoding problems, leading to comprehension failure during the reading process (Nassaji, 2006). Reader's ought to apply their morphological, syntactic and semantic knowledge to extract the author's intended message from the text.

Background knowledge is the third factor that affects reading comprehension. Pawlak (2011) described background knowledge as an individual's life experience and the knowledge of the world acquired through life. Grabe (2009) asserted that prior knowledge facilitates not only good readers but also poor readers' reading comprehension. The study's findings showed that, a high degree of background knowledge can even overcome linguistic insufficiencies.

The more background knowledge a reader has that links with the text being read, the more likely the learner will understand what he/she reads. There are two ways of activating background knowledge of learners. One of them is by exposing learners to information books; two is by establishing and maintaining a productive literate environment full of texts that provide learners with numerous opportunities to learn content on a wide variety of topics ((Pardo, 2004).

Research in reading comprehension has shown that the ability to understand texts is based not only on the reader's linguistic knowledge, but also on general knowledge of the world and the extent to which that knowledge is activated before, during and after reading process. There are three separate components that have been identified in literature with regard to prior knowledge: (a) prior knowledge in the content area of the text (familiar vs. novel/new) (b) prior knowledge that the text is about a particular content area (content vs. no content; and (c) degree to which lexical items in the text reveal the content area (transparent vs. opaque). In other words, background knowledge may include topics on specific knowledge, linguistic and vocabulary knowledge, knowledge about text genres and general knowledge about people and the world.

Khanam et al., (2014) stated that a text does not carry meaning by itself; the reader brings information, knowledge, emotions and culture to the written word. More information is contributed by the reader than the text. This suggests that our understanding of the text depends on how much related background knowledge we as the readers possess during the reading process. Readers' failure to make sense of the text is caused by their lack of background knowledge that can easily fit in the content of the text.

Readers bring their previous knowledge and experience to the reading text and as such comprehension is enhanced when they connect their lives and the world with the text (Meneghetti et al., 2006). When a reader has highly developed prior knowledge or experience on the topic, he/she will comprehend the text effectively (Kirby, 2007).

Day and Park, (2005) stated three aspects of background knowledge (schemata). Schemata are the reader's pre-existing framework about the world and about the text to be read. They are content, formal and abstract schemata (Carrell, 1983b). Content

schemata are the background knowledge of the content area of the text. If the reader possesses the content schemata presupposed by the text, the comprehension of the text will be easy (Pardo, 2004). Kern, (2014) added that content schemata are developed through experiences and perception of the reality surrounding us. The second aspect of background knowledge is formal schemata. It involves knowledge of the organizational pattern of different types of texts for example narratives, expository and descriptive (Carrell & Eisterhold, 1983). Familiarity with text structures influences the speed at which the reader comprehends the text. The third aspect of background knowledge is termed as abstract schemata as proposed by Erten and Karakaş, (2007). Abstract schemata involve possession of knowledge that is not necessarily presented in the text. For example, when one reads that 'hotels are businesses that aim to make profit,' it can be inferred that 'they must charge more for their services than those services cost the owners.' This information is not provided in the text to draw any inferences (Grabe & Stoller, 2013). If the new textual information does not fit into the reader's schemata, the reader misunderstands the new information, ignores it or revises the schemata to match the facts within the text. The three types of schemata have been proposed as crucial in comprehending a text. From the above explanation different aspects of background knowledge (schemata) contribute to the comprehension of texts, which involves different levels of mental processes and interaction with the text (Carlisle, 2010; Nassaji, 2006).

The fourth factor that influences reading comprehension is the cultural background of the text and that of the reader. Language is an expression of culture, understanding the cultural content of what one reads is also an important factor in reading comprehension (Mohammadi & Abidin, 2009). When the reader lacks cultural background assumed by the author, comprehending a text becomes difficult. In his study, Mohammadi et al,

(2009) suggested that teachers should teach pre-reading comprehension skill activities to provide necessary cultural background knowledge of the text to be read.

The fifth factor that influences reading comprehension is reading comprehension skill activities. Reading comprehension skill activities are defined as deliberate, conscious techniques that readers employ to enhance their comprehension or retention of textual information. Reading comprehension skill activities are essential as they can assist the readers' reading process and give them a clear sense of direction on what they are comprehending while reading (Hill, 2011).

According to Grabe (2009), use of appropriate reading comprehension skill activities during the reading comprehension lessons may improve reading comprehension performance for both native and second language learners. Reading comprehension skill activities are essential for overcoming language deficiency, help to achieve better reading comprehension, prevent failure of comprehension and support learners' interpretation of the text (Arpacioglu, 2007).

According to Meniado (2016), exposure to reading materials is not always sufficient for active reading. Readers need to go through an active process that requires an interaction between the reader and the text. To assist learners who cannot automatically relate to reader-text interaction, teachers are always advised to make use of reading comprehension skill activities in the reading comprehension lessons to promote comprehension (Day & Park, 2005). The use of reading comprehension skill activities enhances success in comprehension (Yamashita, 2013).

Reading comprehension has for long been recognized as an essential skill in learning. To succeed in a literate society, learners should be able to comprehend what they read. Failure to comprehend hinders learners' success in education and career development. Since the job market requires a literate and highly qualified workforce, schools should direct their effort towards preparing learners to perform well in reading comprehension for better academic performance (Jiang 2020).

There is evidence that, globally, learners are struggling with reading comprehension. For example, data from comprehensive meta-analysis of empirical studies from National Assessment of Educational Progress (NAEP) 2007 show that more than two-thirds of eighth- grade pupils could not comprehend a text at their grade level in the United States of America. More than a third was also found to read below the necessary literacy skills (Murphy, Wilkinson, Soter, Hennessey and Alexander, 2009). The findings also showed that roughly two-thirds of twelfth graders read and wrote below proficiency level; they were not able to accurately and fluently understand the words, sentences, and paragraphs and use their knowledge to learn from the text.

One widely recommended method of improving learners' ability to comprehend second language texts is an explicit teaching of reading comprehension skill activities (Neufeld, 2005).

1.2.1 Reading Comprehension Situation in Kenya

English is a second language and the language of instruction in Kenya. It is an official language used in government and administration, the supreme court, in media and in education. The education policy is that the language of the school's catchment area is used for instruction for the first three years of primary school (Kenya Institute of Curriculum Development, 2013).

English language is the medium of instruction from primary 4, through secondary, tertiary and higher education (Koech, 2000). It is a compulsory and examinable subject in both primary and secondary schools. All subjects in the curriculum, except other languages such as Kiswahili, French, and German, are examined in English language. This critical role of English language places a significant role on the teachers of English ability to impart all necessary language skills, among them reading comprehension skill to the learners. The long-term goal of teaching English language is the acquisition of communicative competence and not mere passing of examinations (K.I.C.D, 2002).

Comprehending what is read in English as a second language is a determining factor of the performance in most of the school subjects offered in the Kenyan curriculum. Despite this, learners continue to register poor reading comprehension performance. There is a national concern in Kenya about poor comprehension performance of written material by learners of all levels of learning (Athiemoolam and Kibui, 2012). In their study, Athiemoolam and Kibui, 2012) found out that learners had limited background knowledge to draw from and were not exposed to enough reading content thus making them not to comprehend texts adequately. The implication of their finding was a call for a program that should focus on reading comprehension activities like inference, prediction and interpretation among others.

Secondary schools' learners in Kenya lack adequate text comprehension due to difficulties in processing and storing information in the long-term memory (Athiemoolam & Kibui, 2012). Uwezo East Africa, (2013) a research organization that monitors educational achievement revealed that, by class five, 33 percent of class five pupils in Kenya could not read and understand simple class two English stories. The study focused on learning facilities and children's socio-economic background. The study concluded that despite significant gains in school enrolment, pupils are not learning core skills such

as reading skill expected at their age and grade level in Kenya (Uwezo East Africa, 2013).

According to Dinga, (2011) pupils in Kenya appear to have basic ideas about text reading; however, some lack necessary but essential knowledge such as inference when answering comprehension questions. This could be due to lack of inference reading comprehension skill activities during the reading comprehension lessons.

In Kenyan secondary schools, the time allocated for teaching the English language is six lessons per week of forty minutes in form one and two classes, and eight lessons a week in form three and four classes. According to Kenya National Examinations Council, (2013) during the reading comprehension lessons, teachers ask learners to turn to an appropriate page in the reading comprehension text book, then read and answer the accompanying comprehension questions, or after reading, the teachers spend time asking learners questions until the desired answer is given. In a nutshell, the typical reading comprehension lessons in Kenya are primarily product-oriented and reading comprehension is a "one-off" activity, where learners read a comprehension passage from a textbook and answer the questions, mark them either orally in class or present them afterward for marking (K N.E.C 2013).

The poor performance of learners in public examination more specifically in reading comprehension is traced to lack of reading comprehension skill activities in reading comprehension lessons. This lack of exposure to reading comprehension activities may be the reason why a majority of Kenyan secondary school learners are said to be poor in reading comprehension (K. N.E.C 2013).

Reading comprehension teaching is more than what is happening in Kenyan reading comprehension lessons. The teaching process can be enhanced by exposing the learners

to reading comprehension activities before, during and after reading to help build their background knowledge (Cockcroft, 2014). It is this exposure that may be lacking in Kenyan secondary school reading comprehension lessons.

Secondary school learners move to higher institutions of learning where they read even more complex texts. In addition, some learners' move from secondary schools straight to the job market where there is a need to comprehend authentic materials. Therefore, there is a fall back on the reading comprehension skill activities learnt in secondary school. In recognition of these high demands of reading comprehension skill activities, secondary school learners should have the ability to comprehend texts that they read.

The reading comprehension skill is one of the language skills that is taught and tested in Kenyan secondary schools. In addition, other important aspects of reading skill such as proficiency and fluency, are taught. The Kenyan secondary school form three English language syllabus requires that learners be exposed to various reading comprehension activities such as inference making, note-making, summary writing, paraphrasing among others. The learnt reading comprehension skills are most explicitly tested in the English language paper 2 done at the end of the four-year secondary school course national examination. The skills are marked out of 20; however, performance in this section has been low (K.N.E.C 2013).

In addition, in Kenya, like many other countries in the world, reading comprehension is one of the least developed linguistic skills. as manifested in K.N.EC (2017) report. In the report teachers were advised to go an extra mile by not giving learners reading comprehension passages to read and answer questions but to help learners analyze the reading comprehension passage to discover different approaches and styles the authors use to communicate their message.

From the foregoing, some of the factors that affect reading comprehension that have been investigated in Kenya in general include: lack of transfer of information to long-term memory, inadequate vocabulary (Athiemoolam & Kibui, 2012); inadequate facilities and economic background (Uwezo East Africa, 2013); and independent reading level and background experience (Tafida & Dalhatu, 2014). The poor performance in reading comprehension skills in K.C.S.E English Paper 2 continues while the teaching methods, approaches, and strategies mostly remain the same.

Reading comprehension is one of the most important aspects in the learning process because firstly, most of the learning concepts are given to learners through texts and secondly, it is a part of general language proficiency. In addition, it is core to the learning process in secondary schools. Therefore, there is need for secondary school learners to interpret the meaning of words and sentences and at the same time create a mental model of what they read in order to succeed in their academic life and beyond. Two ways of improving reading comprehension performance in secondary schools is: one, by exposing learners to reading comprehension skill activities during the reading comprehension lessons and: two, to find the meaning of erroneous answers from reading comprehension assessment passages after the exposure. However, from my experience as a secondary school teacher of English language, I had observed that secondary school learners are not exposed to reading comprehension skill activities during the reading comprehension lessons as they are supposed to, neither are the meanings of erroneous answers obtained from reading comprehension passages analyzed with an aim to improve on them. During reading comprehension lessons, learners read a comprehension passage from a textbook and answer the comprehension passage questions, mark them either orally in class or submit afterward for marking. Teachers assess reading comprehension rather than teaching comprehension through reading comprehension skill activities. A range of comprehension opportunities for teaching comprehension arise out of many pre-, while-

and post-reading activates (Grabe, 2009). Following the continued low performance in reading comprehension skills and the probable attributed reasons as outlined above, a need was felt to expose learners to reading comprehension skill activities during the reading comprehension lessons to examine whether the Kenyan secondary school learners would improve their reading comprehension. Thereafter, there was also need to examine the meanings of erroneous answers obtained from reading comprehension assessment passages after the exposure. Specifically, the study examined the determinant of nine reading comprehension skill activities that were grouped into three major phases: the pre-reading phase: *previewing, prediction and semantic mapping*; the while-reading phase: *inference making, note-making and paraphrasing;* and the post–reading phase: *summary writing, question posing and group discussions.* The study went further to examine the meanings of erroneous answers obtained from reading comprehension assessment passages after reading comprehension skill activities intervention.

The impetus of this study was that although many reading comprehension skill activities have been proposed by different authors to be used in reading comprehension lessons, not much has been done on how different reading comprehension skill activities to determine reading comprehension performance and what the meanings of erroneous answers obtained from reading comprehension assessment passages after exposure are.

1.3 Statement of the Problem

Form three English language syllabus recommends the use of reading comprehension activities during the reading lessons. However, Kenya National Examinations Council, (K.N.E.C) 2010;2011;2012;2015 and 2017 attributed poor performance in reading comprehension to inadequate reading comprehension skill activities like inference making, note-making, paraphrasing among others in reading comprehension lessons. An extreme drop of reading comprehension performance occurred in 2011; 2012; 20132015

and 2017. In addition, the KNEC chief examiners reported that the learners were at a loss in questions testing reading comprehension skills. This study, therefore, investigated the relationship between reading comprehension skill activities; how these activities predicted reading comprehension performance. In addition, it examined the meanings of erroneous answers obtained from reading comprehension assessment passages after reading comprehension skill activities intervention. This is the gap this study set out to fill.

1.4 Research Objectives

i. To establish the difference between results of control and experimental group in the post-test of reading comprehension performance.

ii. To find out the relationship between the reading comprehension skills activities and reading comprehension performance.

iii. To determine the extent to which previewing, prediction and semantic mapping as pre- reading comprehension skill activities, predict reading comprehension performance.

iv. To examine the extent to which inference making, note-making and paraphrasing as while-reading comprehension skill activities, predict reading comprehension performance.

v. To determine the extent to which summary writing, question posing and group discussion, as post-reading comprehension skill activities, predict reading comprehension performance.

vi. To identify and examine the meanings of erroneous answers obtained from reading comprehension assessment passages after reading comprehension skill activities intervention.

1.5 Research Questions

The present study sought to answer the following research questions:

i. What is the difference between results of the control group and experimental group in the post-test reading comprehension performance?

ii. What is the relationship between reading comprehension skills and reading comprehension performance of the control and experimental groups?

iii. To what extent does previewing, prediction and semantic mapping activities predict reading comprehension performance?

iv. To what extent does inference making, note- making and paraphrasing activities predict reading comprehension performance?

v. To what extent does summary writing, question posing and group discussion activities predict reading comprehension performance?

vi. What are the meanings of erroneous answers obtained from reading comprehension assessment passages after reading comprehension activities intervention?

The study explored the following hypotheses from the five research questions:

$H0_1$: There is no statistically significant difference between results of control group and experimental group in the post-test of reading comprehension.

$H0_2$: There is no statistically significant correlation between reading comprehension skills and reading comprehension performance of control and experimental groups.

$H0_3$: Previewing, semantic mapping and prediction as pre-reading skills have no significant predictive value in determining learners' reading comprehension performance.

$H0_4$: Inference making, note-making and paraphrasing as while-reading skills have no significant predictive value in determining learners' reading comprehension performance.

$H0_5$: Summary writing, question posing and group discussion skills as post-reading skills have no significant predictive value in determining learners' reading comprehension performance.

1.6 Assumptions of the Study

The following assumptions were made:

i. The learners shared the same cultural background as that assumed by the reading comprehension passages used in the present study.

ii. The learners had some topic content knowledge of reading comprehension passages used in the present study that needed to be activated by reading comprehension skill activities.

iii. The learners had not previously read the comprehension passages used in this study.

iv. The meanings of erroneous answers obtained from reading comprehension assessment passages can be analyzed and point to areas that may require greater attention in teaching reading comprehension skills.

1.7 Rationale of the Study

Reading comprehension is an essential language skill that cannot be 'picked up' but has to be taught continuously. This study falls in the broad area of learning and teaching English as a second language (ESL), specifically in ESL reading comprehension. Research in this area has continued to grow, as more people become second language (L2) users of English. The study is an addition to this discourse.

Kendeou et al., (2008) posited that research in second language reading comprehension has left many questions unanswered. One of the questions is, how L2 learners acquire reading comprehension skills. This study attempted to address this question by exposing learners to reading comprehension activities and thereafter assess the skills. In addition, it sought to find the meanings of erroneous answers obtained from reading comprehension assessment passages after the exposure.

In this regard, findings from this study may inform the English language teachers on the importance of reading comprehension skill activities during the reading comprehension lessons in order to activate the learners' schemata. It may also create awareness among the English language teachers on how and when to use which reading comprehension skill activities during the reading comprehension lessons. Apart from activating the learners' schemata by use of reading comprehension skill activities, the meanings of erroneous answers obtained from reading comprehension assessment passages in this study, may further inform the English language teachers the need to evaluate any errors they encounter from their learners' reading comprehension assessments, with an aim to focusing their teaching of reading comprehension in the specific types of errors.

More knowledge may be created from the findings of this study, adding onto the already existing knowledge on reading comprehension skill activities and error analysis. The outcome of the findings of this study would add value to the existing theory of practice on teaching of reading comprehension in the Kenyan secondary schools.

1.8 Scope of the Study

This study focused on nine reading comprehension skill activities namely; *previewing, prediction, semantic mapping, inference making, note-making, paraphrasing, summary-writing, question posing and group discussion*. It particularly examined how the skills correlated and determined reading comprehension performance of form three secondary school learners. The study did not focus on other reading comprehension skill activities such as decoding, fluency and automaticity as such reading comprehension skill activities are said to be done at primary school level. The study further identified and examined the meaning of erroneous answers obtained from reading comprehension assessment passages.

The intervention of reading comprehension skill activities was carried out in form three English reading comprehension lessons of the experimental group. Therefore, assessment

scores on reading comprehension passages from both experimental and control groups and erroneous answers obtained from reading comprehension assessment passages provided the data required for the study.

1.8 Delimits of the Study

This study involved only 73 Form three learners from two public secondary schools in Isinya Sub-County, Kajiado County. The schools were, Moi girls, Isinya and Noonkopir girls. The findings may be generalizable to learners with similar characteristics, but with caution. Data for the study were only obtained from reading comprehension passage assessments and erroneous answers obtained from reading comprehension assessment passages.

There are many different variables that determine reading comprehension performance of learners. Some of these variables are vocabulary knowledge, prior knowledge, metacognitive information, reading attitudes, reading comprehension methods and text form, among others. This study, however, restricted itself on reading comprehension skill activities and erroneous answers obtained from reading comprehension assessment passages.

1.9 Summary

The chapter has presented the introductory aspects that enabled the present study to be situated in the context of studies related to it. It gives the statement of the problem, the research questions and the significance of the study. Scope, limitations and delimitations of the study are also given in this chapter. The next chapter gives a detailed review of literature that places the present study in the context of other reading comprehension studies and also expounds on the theoretical foundations of the present study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE AND THEORETICAL FRAMEWORK

2.0 Introduction

In this section, literature is reviewed in line with the study objectives. First, the three reading comprehension skill activities phases and the activities of each phase that were of major concern for the study are presented. The three phases are: the pre-reading phase, the while- reading phase and the post-reading phase. Secondly, literature on reading comprehension errors is presented showing the various levels where errors occurred. The chapter ends with a discussion of the theoretical framework within which data was collected and analyzed.

2.1. Reading Comprehension Skill Activities

Reading comprehension skill activities are deliberate, conscious practices that readers employ to enhance their comprehension and retention of textual information. The activities are essential as they help the learners in the reading process and give them a clear sense of direction on what they should comprehend before, while and after reading (Hill, 2011).

The aim of reading comprehension skill activities is to prevent failure of comprehension and support readers' interpretation of the text through interaction between the reader and the text. Reading comprehension skill activities activate background knowledge that promote comprehension and interpretation of the text (Khanam et al., 2014).

According to Palincsar and Brown (1984) reading comprehension skill activities nurture comprehension, assist in focusing attention and connects information from the text with the learner's background knowledge.

Ajideh (2006) stated that reading comprehension skill activities are used in reading lessons in order to activate the learners' existing prior knowledge or at least to provide crucial information about the topic they will be reading about. Yukselir (2014) added that reading comprehension skill activities enhance interpretation of the text through interaction between the reader and the text and therefore play a crucial role in prior knowledge activation hence better comprehension interpretation. Knowledge on the value of reading comprehension skill activities comes from pedagogical recommendations or personal experiences and often lack scientific research (Erten & Karakaş, 2007). Only a few studies have investigated which reading comprehension skill activity is more effective when used on the same text or effectiveness of different comprehension skill activities on the same text with different group of learners (Erten & Karakaş, 2007).

Alsaawi (2013) suggested that learners reading comprehension improved greatly when they are exposed to reading comprehension activities. In his study which aimed to investigate the effectiveness of employing reading comprehension activities to facilitate reading comprehension of 2nd English major, Suphaphon (2007) concluded through his research that on average, the experimental group achieved higher scores on the post-test compared to control group.

This study exposed the learners in the experimental group to different reading comprehension skill activities on three phase procedure: pre-, while- and post-reading phases, and literature regarding these phases was reviewed and presented below.

2.1.1 The Pre-reading Comprehension Skill Activities Phase

Pre-reading activities are devices for bridging the gap between text's content and the reader's schemata (prior/background knowledge). Some of pre-reading activities activities/devices include pictures, brainstorming, previewing, prediction and semantic

mapping. These activities do not tell learners anything that they can find in the text but they make learners want to read the text and help them to relate the text to their own experience, interests and aims. In addition, they activate and build the learners' schemata that is relevant to the text (Al-Issa, 2006).

The pre-reading stage is a necessary phase, transforms the readers' mind from its initial passive state to the active state of mind that reads with purpose, motivation and anticipates new information in the text. The pre-reading phase is considered the most important phase for building background knowledge. This phase deserves special attention since it is here; the learners' have initial contact with the text, where their schemata (prior/background knowledge) will be activated. The purpose of this phase is to arouse learners' interest on the topic, motivate the learners and provide language preparation for the text. It is a phase that attempts to activate the existing schemata and thereby enhance interest in the reading process (Yusuf, 2011). Pre-reading activities phase is aimed to activate the existing schemata, build new schemata and provide information to the teacher about what the learners know. It is also concerned with what the learner brings into the reading process.

Auerbach and Paxton (259) suggest three pre-reading activities of which are also a good indication of schema-theory-based pre-reading tasks. First, activity is accessing the prior knowledge of the readers. Second, the readers write their way into reading by writing about their experiences, which are related to the topic. Third activity which is questioning requires both the teacher and the learners to ask questions based on the topic. This type of questioning is a top-down processing activity. Questions can either be generated by the teacher or by the learners and should be completed in advance of the reading and not at post-reading.

Ajideh (2006, p.276) found that pre-reading activities had a positive relationship with reading comprehension performance of grade twelve learners. He concluded that, 'the usefulness of pre-reading activities is to activate learners' schemata and make them bring their knowledge and skills to the text thus facilitating comprehension.

Similarly, Chen and Graves, (1995) investigated language learning activities used by 418 EFL learners in Taiwan and found that there was a significant relationship between language learning activities and language comprehension proficiency. The study recommended for activation of the learners' schema during the pre-reading phase through discussion of text titles, sub-headings, text photographs, identifying text structure, prediction and semantic mapping. The teachers have to make learners think, write and discuss everything they know about the topic.

Gatbonton (1988) investigated the effects of pre-reading activities of previewing and provision of background knowledge on learners' comprehension of short stories. The post-test results showed a significant strong positive effect on learners' comprehension of short stories. Gatbonton's study recommended that, teachers should expose learners to pre-reading activities such as previewing and background knowledge to activate the appropriate prior knowledge (schemata) that enhance learners' reading comprehension.

O'Malley et al., (1985) investigated application of reading comprehension skill activities of discussion and vocabulary knowledge among high school learners of English as a second language. The results of the study indicated that these pre-reading comprehension skill Activities can be effective for integrative reading comprehension tasks. The study concluded that these activities make the reader to be more attentive and stay focused. Comprehension of a text can be developed through questions posed by the teacher from class discussions or from the reader. The teacher can help the learners by providing them with overviews and vocabulary previews before they begin reading the text. Overviews can be in form of class discussions, outlines, or visual aids. These teaching aids help the

learners to form ideas of what the text is about before they read. It is extremely important for the reader to organize himself/herself before he/she reads. The knowledge an individual possesses of a topic to be read can be activated by specific activities like brainstorming with oneself, mind mapping, use of pre- questioning and visual aids.

In their study Erten and Karakaş (2007) suggested a number of pre-reading comprehension skill activities: previewing, summary writing, brainstorming and think aloud particularly for short stories. The study revealed that there was a significant difference in reading comprehension performance between the control and experimental groups with experimental group performing better in reading comprehension of short stories.

Ness (2011) did an observational study on explicit reading comprehension instruction in elementary classrooms. In his study, teachers used pre-reading comprehension skill activities of questioning, summarizing and prediction to activate learners' prior knowledge. These activities were used during the reading comprehension lessons where the learners were asked to think about the topics related to the passage being read. Learners were also asked to make predictions on what would happen in relation to their experiences. The study found out that the use of these activities improved reading comprehension of elementary school learners.

According to Ajideh, (2003), pre-reading activities such as discussion of the texts' topic, text photographs, sub-titles, previewing, semantic mapping should be taught to English second language learners. In his study, which he aimed to investigate the effectiveness of pre-reading activities in a graduate class. The results revealed that pre-reading comprehension skill activities probably activated prior knowledge of the graduates. The study concluded that pre- reading comprehension skill activities are a relevant aspect of memory; help learners create a whole interpretation of what is read by providing them with a skeletal summary before they read; they are the heart of how readers understand

and enhance their comprehension by connecting their previous knowledge and experience with text, their lives and world. Use of previous knowledge on comprehension does not only empower readers to fill in incomplete information but also assists them to create a mental picture that helps them remember what was read and understood. The teaching of pre-reading comprehension skill activities has been emphasized to provide anticipation and activate readers' background knowledge, motivate readers and make them more confidence (Maglianoet al., 2011).

In his study Yusuf, (2011), exposed experimental group to pre-reading comprehension skill activities of previewing, pre-reading discussion groups and brainstorming. In his study the experimental group which was exposed to the pre-reading activities gained considerable abilities in reading comprehension. The study concluded that these pre-reading activities do not only prepare readers for the concepts that follow but also makes the reading task easier and connects the new concepts more meaningfully to prior knowledge. In addition, the activities activate appropriate knowledge structures and provide knowledge that the reader lacks.

Research on effectiveness of pre-reading activities has shown that not all such activities are significant. For example, Azizifar, (2015) in an experimental group of grade-10 learners found out that the group that received guessing meaning content from pre-reading questions performed better that their counterpart who experienced vocabulary definitions at .05 level of significance. The study concluded that guessing meaning content from pre-reading questions help learners understand key concepts in the text and facilitate the post-reading comprehension of poor readers. The connections that need to be established at pre-reading phase are those between previous experiences and the text.

Research done by Kern, (2014) to evaluate the effect of pre-reading activities of prediction and background knowledge on reading comprehension of French leaners showed that the pre- reading activities had a significant positive effect of readers' comprehension of

reading comprehension passages.

In summary, pre-reading activities provide the reader with background knowledge to comprehend the reading material, elicit prior knowledge, enhance attention, facilitate understanding and stimulate motivation. In addition, they help to activate existing schema, build new schemas and provide the teacher with information about what the learners know. (Pardo, 2004).

Results from the studies reviewed above made the researcher realize the significance of using pre-reading comprehension skill activities in reading comprehension lessons. This study, therefore, aimed to examine whether three pre-reading comprehension skill activities namely; previewing, prediction and semantic mapping help learners perform better in reading comprehension.

2.1.1.1 Previewing Reading Comprehension Skill Activities

Previewing reading comprehension activities is reading contextual clues like titles, headings, sub-headings, pictures and photographs in a text. They help learners to formulate hypotheses about the text and draw inferences prior to reading (Yusuf, 2011). The purpose of previewing activities is to help readers predict what is in the text and thus activate effective schemata for reading comprehension.

According to Day and Park (2005), previewing reading comprehension skill activities build learners' knowledge of the upcoming text before they read. These activities are significant as they draw out predictions that help learners relate text information to prior knowledge. Day and Park recommend the use of teaching of previewing skill activities in reading comprehension lessons.

Pressley's (2002) study suggested that in previewing the reader writes a set of questions that he/ she hopes to answer from the text to be read. The study found out that previewing reading comprehension activities help readers to think about what they will read and pull-

out relevant information as they seek to answer questions. Other previewing activities as suggested by Kern (2014) were writing about reader's experiences related to the topic, making predictions based on previewing and skimming for general idea.

Chen and Graves, (1995) found out that a combination of previewing and semantic mapping as pre-reading comprehension activities is more effective than only using semantic mapping on short stories. The study also explored the effectiveness of previewing and provision of background knowledge and concluded that previewing is more effective than provision of background knowledge. Contrasting findings from Zhaohua (2003) showed that provision of background knowledge could help learners comprehend texts better.

Finally, Erten and Karakaş, (2007) reported that some activities, for example, a combination of previewing and questioning contributed to literal comprehension while a combination of inference and discussion contributed better to the evaluative comprehension of short stories. Literal comprehension involves understanding the straight forward meaning such as what the visual aids in the text show, finding facts and vocabulary. Evaluative comprehension involves being able to make judgment about entirety or some aspect of the text. Literal comprehension is integral of evaluative comprehension (Erten and Karakaş, 2007).

2.1.1.2 Prediction Reading Comprehension Skill Activities

Prediction is 'the prior elimination of unlikely alternatives (Khanam et al., 2014.p.90). 'These are questions the readers ask the world and look forward for the reading comprehension passage to provide the answers'. Ajideh, (2003) emphasized that prediction skills are effective when reading texts that contain familiar subject matter. Al-Issa, (2006) stated that, 'prediction brings potential meaning to texts, reduce ambiguity and eliminate in advance irrelevant alternatives, thus generation of comprehensible

experience from inert pages of print is possible.'

Prediction activities are the most important pre-reading activities proposed by schematic theorists. This is because prediction activities make the brain to always anticipate and predict as it seeks order and significance in sensory inputs. In addition, these activities allow learners to realize how much they know about the topic of the text (Carrell, 1984).

There are two ways of carrying out prediction activities in a reading comprehension lesson. First, the learners are asked to read the title and say what they know about the subject of the title. Second, they are asked to read the first paragraph which generally introduces the topic of the text. Third, they read the topic sentence of each paragraph which gives the main idea of the paragraph. Finally, they read the last paragraph of the passage which often reveals the conclusion of the topic. In prediction, learners use their own knowledge of the topic to determine what might happen next in the text or at the end of the text (Yusuf, 2011).

The second way to carry out prediction reading comprehension activity is use of preview/ prediction approach. This approach begins by introducing the topic of the reading comprehension passage the learners are going to read. Then the learners are asked to draw two columns. In the first column they list things about the topic that they are sure of (preview) and in the second column to list things they are not sure of or do not know (predict) about the topic of the reading comprehension passage. As shown in Figure 1 below.

Sure (Preview) (Prediction)	**Not Sure/ do not know**
1. Crocodiles are not fish	1.How many kinds?
2. They have rough skin	2.How long do they live?
3. They live in water	3.How long is the largest?
4 How fast can they swim?	
4. They are dangerous	
5.	How fast can they swim?
	6. How heavy are they?

***Figure 1*: An Illustration of a Preview/Prediction Activity**

Source: (Yusuf, 2011)

The sure things (preview) activate the background knowledge while the not sure/do not know things (prediction), is what the reading comprehension passage about *crocodile* may provide the answers for.

In his experimental study on the effects of prediction activities practice on young children's reading comprehension, Hansen, (1981) found out that prediction prior to reading helps to highlight the learners' related knowledge thus increase the likelihood that while reading the learners will be more disposed to integrate text and prior knowledge.

Semantic Mapping Reading Comprehension Skill Activities

Semantic mapping reading comprehension skill activities are an organized map of vocabularies or concepts that are associated with the text topic and reveal what the learners already know about the topic of the text. It is a process for constructing visual displays or diagrams that are used to represent words and ideas linked to and arranged around a central key word or idea of the text and show categories and their relationship (Iranmehr et al., 2011). Semantic maps are also referred to as web-like organizers, spider maps, mind maps or sunbursts.

Semantic mapping entails pre-teaching vocabulary probably requires that the words to be taught in semantically and topically related sets so that word meaning and background knowledge improve concurrently.

Readers engage in a brainstorming process on a given key word or concept related to the

topic of the reading comprehension passage. The objective is to make sure that learners have the relevant schema for understanding the text and provide a link of what the learners know and what they will read before reading the passage. This stimulates readers' cognitive structures and assesses their knowledge in terms of a specific topic (Meneghetti et al., 2006).

Cervetti et al., (2012) described semantic mapping as a useful activity to pre-teach vocabularies and provide the teacher with an assessment of the learners' prior knowledge or schemata available on the topic. They added that in semantic mapping learners are asked to brainstorm about the reading topic as the information is displayed as a 'map.' As the learners make association, the map becomes thorough on summary of concepts and vocabularies that they will encounter when reading.

In a reading comprehension lesson, the teacher highlights lexical elements in a text that seem to be in close relationship with the main topic of the text. Learners are then asked to give words or concepts associated with the key lexical item. This makes the relevant schemata to be activated in their mind. For example, learners can be asked to list word associations which might be linked up by the key word for example '***money***': 'purse', 'coin',' note', 'bank', 'poverty', 'pay day' and 'interest'. These words reflect very different categories and levels of generalization. The word associations are then classified and sub-categorized. Semantic mapping portrays the schematic relations that compose a concept. It assumes that there are multiple relations between a concept and knowledge that are related with the concept. Thus, for any concept, there are at least three types of association: association of class, which is the order of things that the concept falls into; association of property which includes the attributes that define the concept, and thirdly, association of example, which are the exemplars of the concept (good example of something).

In a pre-and post-tested study Carrell, Pharis, and Liberto (1989) found that the learners in the teacher-learner interactive semantic group scored significantly higher than the control groups. Pressley (2002) tasked learners to use semantic mapping to find the meaning of unfamiliar words in reading comprehension passages. The results revealed that semantic mapping of vocabularies or concepts that are associated with the topic helped learners to understand the text, make the context clear and help them to grasp the meaning of the text. This is where the use of semantic mapping activities becomes important.

Stahl and Vancil (2015) study used three intact 6^{th} grade classes to find out the effectiveness of semantic map activities by use of key words which gave learners an introductory idea to link what they knew and what they were about to read with possible content of the text. The study found out that semantic mapping activities prepare learners to understand, assimilate and evaluate the information to be read, bring information to the conscious level and make learners make sense of the topic to be read.

Mozayan et al., (2012) investigated the effectiveness of implementing semantic mapping as a pre-reading activity on reading comprehension of 2^{nd} English major learners. The results obtained from the study showed that the experimental group achieved high scores on reading comprehension post-test in comparison to control group. The study concluded that intervention of semantic mapping activities activated the reading comprehension schema of experimental group. Mozayan et al., (2012) concluded that one important aspect of semantic mapping is that the teacher uses the collective learners' prior knowledge of the topic of the reading comprehension passage and arranges that prior knowledge into related sub-categories.

Some researchers have found semantic mapping as most effective when exposed to the

learners before, during and after reading (Wahyuni, 2010). These researchers advocated for three phases as follows; at pre-reading phase the teacher writes the reading comprehension passage topic on the chalk board, have learners brainstorm on words related to the topic, write categories in form of a map, have learners provide labels for each category, discuss the words on the semantic map and revise the map after discussion. At this phase it is crucial that all responses are accepted as long as they relate to the topic. At this phase learners' background knowledge/schemata is built, activated and determined on how much is required before the learners start to read a given reading comprehension passage. *Categorization* of the concept happens at this phase where learners are asked to give out subordinate ideas that help explain or clarify the main concept (Wahyuni, 2010).

During the while-reading phase, the learners are provided with the reading comprehension passage related to the topic which contains more words and information than what the learners had at pre-reading phase. As they read, they are allowed to add or eliminate information from the semantic map. New information is thereby integrated with prior information. This is called *personalizing* the map. At this phase, semantic mapping helps learners to understand the written expression, remember the words of the reading comprehension passage and the reading passage becomes more memorable (Gilakjani & Sabouri, 2016b). At this phase, the semantic mapping activity helps learners to record the information obtained from the reading comprehension passage which make them to be more active, interactive and creative.

At the post-reading phase, the learners integrate the personalized semantic map with the one brain stormed at the pre-reading phase through a discussion on what information they have learned from the reading comprehension passage and how it has changed or added to the ideas shown on their original map. This phase is called the *post assignment synthesis*. Semantic mapping at post-reading phase help learners recall and organize

information that they have learnt from the reading comprehension passage as they discuss and make connections between words or concepts from the topic.

2.2 The While-Reading Comprehension Skill Activities Phase

The while-reading phase is a phase for schema actualization. The purpose of the while-reading phase is to enable the reader to extract relevant information from the text. It is the phase that helps learners to understand the sequence of events in the text, characters, style and language. At this phase, the teacher guides and monitors the interaction between the reader and the text. This is the actual reading process where the teacher should inculcate in the learners the skill of making predictions of how different schemas work based on the learners' experience and the text presented information. This way they continue to build upon their own existing schemata and promote an interaction between the reader and the writer (O'Malley et al., 1985) In addition, the prediction guides the students to detect the important information in the passage and generate the inferences that they can. The text generally does not contain all the information. The authors leave out information and detail that they assume the readers can understand and retrieve from the context and co-text of the text.

Most of the authorial intention is a matter of implicature which the readers are expected to calculate based on the context. This requires that the readers to generate inferences based on the information provided in the text. In conclusion, an effective reader should constantly check their understanding of message by making predictions, confirming predictions, making inferences, evaluating and reflecting. The readers make a number of inferential processes while reading such as synthesis of new information, expanding present knowledge, widening beliefs and updating misunderstandings of the text. The three main connections that readers make are: text to self, text to text and text to world.

While-reading comprehension skill activities aim to motivate the learners to be flexible, active and reflective readers (Gurses & Adiguzel, 2013). These activities develop the learners' linguistic and schematic knowledge. They also help the reader to continuously check for his/her own understanding of the text being read. The while-reading comprehension activities that were of interest to this study are inference making, note-making and paraphrasing and they are reviewed in the sub-sections that follow.

2.2.1 Inference Making Reading Comprehension Skill Activities

Inference is the information that is activated during reading process, yet not explicitly stated in the text. It involves putting together what is written and unwritten in the text implying that this is the readers' knowledge from prior learning and the personal experiences (Rapp et al., 2007).

Inference is a way of obtaining information not explicitly stated in the text. An inference is a product of the interaction between the reader's knowledge and the information in the text (D'Ulizia et al., 2011).

To construct inference, readers read between the lines, add what is in the text content to what is in their mind (background knowledge) and experience. It is important to note that life circumstances and opportunities, friends, family, culture and school shape the background knowledge and experiences that learners bring into the text. This involves combining what is provided in the text with personal experience and intuitions (McKown & Barnett, 2007).

The objective of the inference activity is to measure the ability of learners to construct the implied meaning from the text. There are four types of semantic inferences: logical inference (based on a reason), pragmatic inference (based on our knowledge about the

world), plausible inference (based on the possible occurrence of an event not supported by information from the text) and lexical inference (deduce the meaning of words by use of linguistic context clues).

In an experimental study on effects of inference on expository reading comprehension passages of 16th grade class, Elbro and Buch-Iversen, (2013) found that learners in the experimental group out performed learners in the control group on inference making of reading comprehension passages. The study also found that, one; erroneous inferences were caused by some readers lack of knowledge to form inferences needed to comprehend a text; two, inadequate background knowledge and three, poor understanding of the text or some readers had relevant knowledge but did not use it to infer. The study concluded that inference requires integration of background knowledge with information from the text to form a coherent representation of the meaning.

Findings from longitudinal studies have provided evidence on the importance of inference making for the development of reading comprehension (Rapp et al., 2007). The findings from such studies indicate that the ability to make inferences contributes to reading comprehension even when other abilities and knowledge are controlled, such as decoding (ability to apply knowledge of sound-letter relationship), vocabulary awareness, text's structure (ability to understand familiar and unfamiliar words and phrases) and comprehension monitoring (evaluation and regulation of one's ongoing comprehension processes). Thus, there may be a specific link between inference making and reading comprehension. However, longitudinal studies do not make strong conclusions about causality (D'Ulizia et al., 2011).

In his experimental study on the effects of inference training and practice on young children's reading comprehension, Hansen, (1981) found that inference is a necessary process involved for comprehension and that prior knowledge is a determining factor to inference. There is need to create realization that learners must draw inferences between print and prior knowledge. For learners to read successfully, they need combination of decoding and understanding if they are able to make sense of what they read. In order for comprehension of written text to take place, readers must infer or deduce meaning from the text using words written by the author (D'Ulizia et al., 2011).

According to Kirby (2007) inference is categorized under the reading skills activities learners use while reading. In emphasizing the same Magliano et al., (2011) associated inference making with thoughtful readers, who are able to use what they know, put together the clues from the text and think ahead to draw conclusions. Magliano et al., (2011) asserts that inference requires learners to use their own knowledge and intuitions.

The answer to an inference question is not in the text, but the text provides information that will help the learner to infer. Inference depends heavily on prior knowledge; therefore, failure to activate the background knowledge may cause problems in reading comprehension performance (Elbro & Buch-Iversen, 2013). The findings from the Elbro and Buch-Iversen study indicated that the ability to make inferences contributes to reading comprehension even when other abilities and knowledge are controlled, such as vocabulary awareness (the ability to identify and understand key terms as well as unfamiliar words and phrases), text structure (how information within a written text is organized, for example, descriptive, narration or expository) and comprehension monitoring (process in which learners determine whether they understand what they are reading or not). The study concluded that there is a relationship between inference making ability and reading comprehension performance.

Texts cannot be understood without contribution from readers. Texts provide instructions to the readers about how to use relevant knowledge and experience to build understanding of the text. This building of understanding depends heavily on the reader's ability to draw inferences (Pardo, 2004). In his study Hansen, (1981) investigated the effects of inference making and question making with second grade learners (7-8 years). The results of post reading comprehension assessment revealed that the learners in the experimental group out-performed those of the control group. He concluded that when inference as while-reading comprehension skill activities is exposed to learners, comprehension is improved.

A similar study by Hansen and Pearson (1983) on teaching inference making on second grade learners (7-8 years) involved learners being taught how to draw inferences between new information and prior knowledge and how to discuss some of their own experiences

that were similar to the events in the text. The study found that the experimental group benefited significantly from the intervention on inference activities.

Kern (2014) carried out an intervention study to determine the effect of inference activities on reading comprehension. The control group received no intervention on inference but wrote the same assessments as the experimental group. The findings revealed that inference intervention had a significant strong positive effect on learners' reading comprehension.

Understanding of a text depends on a reader's ability to draw inferences. Most inferences are understood automatically during reading and others are not. The present study exposed learners to two types of inferences: gap filling inference and contextual inference. Gap filling inference enriches the mental representation of the text and connects information from the text with prior knowledge. For example, '*John dropped the pot. He ran for the dust pan and brush to sweep the pieces*.' The reader has to draw upon life experience and general knowledge to realize that the pot broke to supply the connection between these two sentences. Contextual inference is use of contextual clues to figure out the meanings of unknown words.

In the present study, the teacher modeled the inference activities during the reading lesson by asking questions such as, 'How do you know?' whenever an inference is generated in the discussion of a text. He/she also asked questions that fostered comprehension monitoring such as 'is there information that doesn't agree with what the learner already knows?' On the other hand, the learners asked themselves 'why, who, when' questions while reading. Learners also need to generate associations around the topic, discuss and clarify their collective knowledge.

2.2.2 Note-Making Reading Comprehension Skill Activities

Note-making as while-reading activities combines reading, summarizing and writing. During note-making the learners reach the highest level of comprehension. These ctivities help learners to organize ideas and keep them focused on their reading, aids concentration and helps to relate ideas to other information. It is an active and focused activity where the readers assimilate all information and make sense of it. This improves the learners' reading comprehension performance.

Two functions of note-making activity skills are distinguished: One, it facilitates reading comprehension by increasing learner attention, raising awareness of the text content, storing of information into memory and motivates the learner to compare the text information with previously learned information. Two, it serves as an external storage of information in retrieving the content in answering the reading comprehension questions (Manoli & Papadopoulou, 2012).

Rahmani and Sadeghi, (2011) examined the process and product effect of note-making as a reading comprehension activity. The experimental group received intervention of note-making activities. The results of the study revealed that the experimental group learners performed significantly better in comparison to the control group on reading comprehension on recall tests.

One important reading skill activity teachers can impart to learners while in the reading phase is note-making because it allows learners to compile new vocabulary, summarize information and record their reactions and opinions.

2.2.3 Paraphrasing Reading Comprehension Skill Activities

Paraphrasing reading comprehension activities comprise rewriting a piece of text in one's

own words, while retaining the meaning. It is rewriting of lengthy or complex sentences into simpler sentences or combining sentences into more interesting, complex sentences. It is translating ideas and information into learners' own words. It is also an act of taking a sentence from a text/passage and then simplify it by putting it in one own word. It is usually similar in length to the original text. A paraphrase is always written in the learners' own words but it is all restatement of the original information (Kletzien, 2009).

Kletzien, (2009) stated that paraphrasing activities help the readers to make connections with their schemata, to access what is already known about the topic and to use the words that are part of the reader's knowledge. It assists the reader establish retrieval cues that enable integration of what is formerly known.

Paraphrasing is a reading skill activity which helps place information into long-term memory as learners move to understand the reading comprehension text. It involves replacing difficult vocabularies/words or phrases with words the learner understands. Paraphrasing is used to help the reader comprehends the text more thoroughly (Khanam et al., 2014). The learners' task is to generate a literal representation of a sentence read by substituting many words and phrases in it (Hua et al., 2014).

In their study Khatib and Safari (2011) found learners with underlying language processing problems facing paraphrasing difficulties. They stated that limited vocabularies and inability to construct complex sentences make it difficult for learners to come up with a different way of writing things in their own words.

In a reading comprehension lesson, the learners stop reading, look away from the text and put what they have just read into their own words. If they are not able to do that, they reread the reading passage to check whether they have understood the passage (Kletzien,

2009). The teacher models some examples and asks learners to write sentences in their own words. They also practice other sentences and paragraphs. As the lesson proceeds, the teacher may ask the learners to paraphrase the sentences individually. Through this activity they can learn some new vocabularies and synonyms from their classmates in addition to their own.

The synonyms used in paraphrasing should not change the meaning of passage/text. The word class of the word being paraphrased should be checked. In addition, replacing the key words the learners change the structure of the original sentence by either inverting the word order of the sentence or replace the words without changing the original meaning. In his study Kletzien (2009) recommended that learners are instructed how to paraphrase before they independently apply this skill.

Kletzien (2009) found that paraphrasing helped the learners to link prior knowledge with what they already know about the topic and use words that are part of the reader's knowledge. In his study learners were able to integrate what was previously known with what was being read.

The paraphrasing activities in this study focused on changing the word order of sentences from the reading comprehension assessment passages.

2.3 Post-Reading Comprehension Skill Activities Phase

The post-reading phase of reading comprehension activities reflect on what has been read and relate the text to the learners' own knowledge or opinions and interpretation of the text. They also facilitate the chance to evaluate learners' adequacy of interpretation, while bearing in mind that accuracy is relative and that 'readership' must be respected as long as the writer's intentions are addressed (Li, 2011).

At this phase, the learners integrate their background knowledge into a new schema structure. For example, learners present similar experiences as the one presented in the text. Post-reading phase is the time to assess whether the purpose for reading has been achieved. Some of the post-reading activities suggested are role play, summary writing, questioning, discussion skills, thinking aloud among others (Parr & Woloshyn, 2013). The post-reading comprehension activities that were of interest in the present study are reviewed below.

2.3.1 Summary Writing Reading Comprehension Skill Activities

Summary writing is the ability to reduce a larger piece of text so that the focus is on the most important elements in the text. It is an activity that helps the learners to determine what is important from the text and to condense information into the reader's own words. Summarizing helps learners to distinguish between main ideas and supporting ideas (Gersten et al., 2001).

A summary should be shorter than the original work. This depends on the purpose of summarizing and the need of what is to be summarized. A summary should include the main ideas of the text; reflect the structure and order of the original work. Readers are supposed to reduce the length of the passage by approximately one-third through reducing lists in general statement, selecting a topic sentence or constructing one if there is none stated, delete redundancy and irrelevant information. Summary writing is therefore formal writing and requires much more practice than paraphrasing (Pearson, 2009; Kintsch & van Dijk, 1978).

The steps that were followed in summary writing in the present study included listing of ideas in phrase form which were then grouped into logical categories; the phrases were then turned into sentences and were combined into a paragraph using transitional words.

Paragraphs were supposed to have topic sentences, then they were proof read as first draft for punctuation and unity. The final copy was then written.

2.3.2 Question Posing Reading Comprehension Skill Activities

Question posing reading comprehension skill activities require readers to ask questions in order to construct meaning, enhance understanding, find answers, solve problems, find information and discover new information. In a quasi-experimental group, Soleimani and Esmaeili (2014) found that the experimental group learners significantly improved their reading comprehension scores over time from pre-test to post-test.

In a mixed method approach, Arpacioglu, (2007) found that when experimental group learners were exposed to questioning activities during the reading comprehension lessons, they performed significantly better in comparison to the control group. The study concluded that questioning as a post-reading activity is important because it facilitates comprehension, helps learners synthesize new knowledge with the pre-existed one, enriches their imagination and improves their creativity.

Questioning helps learners to become aware of whether they can answer the reading comprehension passage questions and if they understand what they have read. This activity helps learners to ask themselves questions that require them to combine information from different segments of the reading passage.

2.3.3 Group Discussion Reading Comprehension Skill Activities

Group discussion skill as a reading skill activity can be defined as a teacher guide to learners in expressing their opinions and ideas on the topic of reading comprehension passage. This activity works on the principle that knowledge and ideas of several learners are likely to find answers to a specified topic (Yusuf et al., 2016).

Discussion skill activity involves breaking the class into small groups for effective talking on the topic. The learners talk freely to the teacher which makes the flow of information easy (Yusuf, 2011). Learners evaluate the reading comprehension passage and respond to it from a more or less personal point of view. Learners may be asked to agree or disagree with some information from the written text, characters, or the author; relate content to their personal experience; discuss incidents, characters, ideas, feelings; and go beyond the text to share opinions (Wahjudi, 2010).

After reading a comprehension passage, the teacher asks learners to relate or write what they have read to their experience by asking questions such as 'Have you ever had a similar experience like the one expressed in the reading comprehension passage?'

In pre-test- post-test experimental study Yusuf, (2011) found that exposure to discussion skill activities facilitated reading comprehension ability as his experimental group gained considerable ability in reading comprehension than control group among senior secondary schools.

In summary, the pre-reading phase bridges the gap between learner's own schema and the text content. At while-reading phase, learners build their own schema and at post- reading phase they integrate existing schema into a new schema structure. Pre-, while- and post-reading skill activities are used to activate learners' existing knowledge, thereby creating a mental framework to which the text terms and ideas can be attached. This mental framework begins before reading to strengthen learners' interaction with the text while reading and reflected upon after reading as learners incorporate what they have just read into their core knowledge (Womack & Hanna, 2010).

Two, pre-reading, while-reading and post-reading activities help the learners to enlarge the background knowledge and link the prior knowledge to the texts so as to direct them into a much deeper understanding of the text. All reading comprehension activities at the three phases need direct teaching and continuous modeling by the teacher, followed by more limited teacher involvement, then gradually learners begin to gain control over the skills.

Summary of actions of the language teacher at Pre-reading, While reading and post-reading phases

Pre-reading	Actions of the Language Teacher at Pre-reading phase
	i. Involves learners in setting a purpose for reading ii. Learners read the pictures, photographs, sub-titles and titles from the text and state what they see and say what they know about the topic. iii. The teacher preview text with learners using pictures, reading first and last paragraphs, asking questions on topic. iv. Asking learners to look at illustrations and try to guess how they relate to the text topic. v. Preview of structural organizers used in the reading comprehension passage. vi. Learners write down features or things they are not sure concerning the text topic (predict things that they are not sure about the topic expecting the reading comprehension passage to confirm for them). vii. On semantic mapping; learners list down the vocabulary/concepts that are associated with the topic (this is to judge learners Schema availability on topic). viii. Task the learners to make guesses/ predict about upcoming information in the reading comprehension passage. ix. Learners read the pictures, photographs, sub-titles and titles from the text and state what they see and say what they know about the topic.

While-reading making, paraphrasing and note-	Actions of the Language Teacher at While reading phase

making	
	i. Asking learners to identify the main idea of the reading passage ii. Task learners to create mental images of the reading passage. iii. Asking questions to check comprehension of the learner iv. Verifying and clarifying learners understanding v. Helping learners guess the meaning of unknown words from the context vi. Draw inferences (learners are asked to state what they infer from a given sentence of the reading passage) vii. Confirm, revise or reject predictions viii. Provide ample assisted practice time e.g., monitoring, providing clues, giving feedback ix. Learners paraphrase either by retelling or writing down some sentences picked from the reading comprehension passage. In doing so, they reorganize sentences, re-word and compare with the original sentence as well as assessing whether the original sentence is represented completely and fairly in the paraphrase.

Post-reading skill Activities; Summary Writing, Questioning and Discussion	Actions of the Language Teacher at Post-reading phase
	i. Allow learners to discuss the reading comprehension passage after reading ii. Task learners to retell what the reading comprehension passage is all about. iii. Ask learners to outline the main ideas / points in the reading comprehension passage. iv. Learners are asked to write notes on a certain aspect of the reading comprehension passage topic. v. Learners asked to draw conclusions about the reading comprehension passage they have read vi. Task learners to summarize the passage /text. vii. Task learners to role play viii. Task learners to read other related/new material and demonstrate use of the activity on their own ix. Check provision of feedback x. Task learners to combine main ideas into a cohesive description of the original content. For example; write an account of an aspect based on the information in the reading comprehension passage. xi. The teacher asks clarification questions such as what does this mean?) As well as contextualization questions like, (How does this relate to…?) xii. Learners are allowed to evaluate, find differences, state merits and demerits of certain aspects of in the reading comprehension.

2.4 Reading Comprehension Erroneous Answers

Corder (1967) points out that errors are an important part of language and language learning. Errors tell how far towards the target language (TL) the learner has progressed and consequently what remains of him/her to learn. Errors provide a researcher with evidence of how language is learned and evidence of strategies or procedures the learners employ in discovering the language. Most importantly, according to Corder, errors provide a way for the learner to test his hypotheses about the nature of the language he/she is learning.

Language errors are divergence from accepted rules of language made by a second language learner; it is lack of knowledge of correct rules of the target language (Al-oudat, 2017). Reading comprehension errors can be phonological, orthographical, morphological, syntactic and lexical forms which deviate from rules of the target language, contravening expectations of the literate adult native speaker generally realized in writing (Kaweera, 2013).

The process of error analysis involves identification of errors, their description, explanation and evaluation. This helps determine which features in the TL are problematic. This information can then aid in planning teaching, selecting and preparing materials and designing syllabuses. Therefore, errors should be viewed positively.

Reading comprehension erroneous answers that emerged from the present study were from word recognition lower-level sub-components processes.

2.4.1 Word Recognition

Word recognition belongs to the lower-level of L_2 reading comprehension processes. It is

a complicated skill, involving many sub-component processes, including visual analysis of the printed symbols, identification of letters, knowledge about grapheme-phoneme correspondence, the generation and application of phonological codes from the written word and the connection of a word with its semantic representation (Kida, 2016). Skilled reading comprises all these processes, which through practice become fluent and cognizance. Our mental lexicon contains at least three sets of knowledge about words; knowledge about visual forms (their orthography), their pronunciation (phonology) and their meaning (semantics) (Coltheart, 2006).

Rapid and automatic word recognition occurs when visual input from the word on the page activates lexical entries in the reader's lexicon that have well represented information of all types: orthographic, phonological, semantic and syntactic. In situation of word recognition difficulty, the influence of contextual information plays a crucial role in word recognition (Carlisle, 2010). Word recognition is viewed as a continuous process of evaluating, integrating and matching the visual features of the word with the relevant model description in memory.

In order for fluent word recognition to occur, a reader must recognize the written word forms rapidly, activate links between the graphic form and phonological information, actuate appropriate semantic and syntactic resources, recognize morphological affixation in more complex word forms and access her /his mental lexicon. In other words, recognition of words involves the interaction of activated orthographic, phonological, semantic and syntactic processes (Andrews et al., 2020).

According to Calderón et al., (2011) word recognition fluency is as a result of a well-formed spelling representation that is connected to phonological and semantic forms. Once orthographic form or spelling becomes more conversant, they start to function

much like a graphic unit that can be recognized as a whole without attention to constituent letters. In other words, well-learned word spelling (i.e., sight vocabularies) are established in memory in graphic form and automatically recalled when they are encountered during reading.

Word recognition, whether in first or second language reading, occurs when the reader experiences a visual orthographic symbol (sequence of letters) related to a written word and uses that information to pronounce the word and obtain the lexical meaning represented by that word in the mental lexicon. The sub-components of word recognition include phonological processes, morphological processes, mental grapheme representation, orthographic and vocabulary processing knowledge. Each of these sub-components is discussed in the subsequent sub- sections.

2.4.1.1 Phonological Processing Knowledge

Phonological processing is the ability to use phonological information, that is, knowledge about sound structure of one's language when processing written words (Burt, 2006; Broek et al., 2011). This process calls for a number of interrelated abilities, including (a) ability to recognize and use the sound constituents of oral language, (b) phonological decoding (the ability to convert the visual print into its corresponding spoken form) (c) phonological recoding (locating and retrieval of the word meaning in the mental lexicon through the use of phonological information) and (d) phonological memory (the use of sound codes for temporary memory storage (Katzir et al., 2006)**.**

In addition, phonological awareness is the knowledge employed by readers to recognize words that rythme, to identify the syllables in words and to recognize and manipulate sound words (Kirby,et al,.2013).

2.4.1.2 Morphological Processing Knowledge

Morphological knowledge refers to recognition of morphemes, the smallest units in language that carry meaning (e.g., prefixes, suffixes, roots). Morphological understanding assists the speller, recognize and point: the presence of additional morphemes *car**s**, girl**s**,* the correct and rational spelling of a morpheme regardless of its pronunciation e.g., regular past tense is always spelled with an *-ed* as in *talked, jumped, kicked*; how base word may be altered when an additional morpheme is attached e.g.; *jog* becomes *jogging* with addition of *-ing*. Morphological knowledge further assists spellers understand relations between base words or roots e.g., *happy/happily busy*/*business*. Also, morphological knowledge is crucial in English spelling system because numerous English words are spelled based on meaning rather than sounds e.g., *Kenya/Kenyan, furnish/furniture.*

2.4.1.3 Mental Graphemic Representations (MRGs)

These are images of words, syllables and morphemes in memory (Kelman & Apel,2016). Spellers develop MRGS from repeated exposure to written language, particularly when decoding (Ehri & Wilce, 1982). As written language exposure increases and decoding competence improves, the number and clarity of MRGs advances in memory and spelling becomes more fluent and automatic (Apel et al., 2016). When orthographic, phonemic and morphological knowledge are insufficient, learners may need to rely on clear MRGS to spell the words accurately.

2.4.1.4 Orthographic Processing Knowledge

Another aspect of word recognition is the orthographic processing which is the use of visual information when processing written words (Apel et al., 2016). There are two

types of visual information contained in a word. One is the information related to the letters, letter shapes and positions as well as the combination of letters that comprise a specific word. This is sometimes referred to as word-specific information (Share, 1999) that distinguishes one word from another. Two, is the general information, that is derived from combination of letters and letter patterns that a word shares with other words. In English, two types of such general orthographic information can be distinguished, statistical redundancy and rule governed regularity. Statistical redundancy has to do with indices that are derived from the probability of occurrence of certain letters or letter combinations in words. Rule-governed regularity refers to the orthographic conventions that are generalized from an evaluation of orthographic conventions that make the combinations of letters likely and some unlikely (Maia, 2018). The acquisition of this knowledge results from extended exposure to writing symbols and configuration (Wagner et al., 1997).

Orthographic knowledge concerns the skills necessary to translate spoken language into its written form. It is knowledge of phoneme-grapheme correspondences. For example, knowing that sound [*k*] can be represented by letters *k, c, cc, ch* or *Qu;* knowledge of rules combining letters for example *qp* letter combination does not exist in English language and competence that of positional constraints on spelling for example, the diagraph *ck* at no time appears in the word initial position (Bourassa & Treiman, 2001). Orthographic knowledge also includes comprehension of orthographic rules such as long and short vowel patterns as *r*-controlled vowels (Albesher, 2018).

The specific patterns of correspondences between the graphic and phonological forms are the orthography of a language. Each language has its unique orthography. A language's writing system defines the linguistic unit that is represented by the graphemes of a

language. English language is an alphabetic language where graphemes represent phonemes or individual sounds.

There is also variation among alphabetic languages in the degree to which graphemes corresponds to phonemes. The range of this variation is called orthographic depth. Orthographic depth of a language has two perspectives: phonological perspective (letter to sound) and spelling perspective (sound to letter).

English language is a highly orthographic language (one of the deepest alphabetic orthographies), meaning that the grapheme-phoneme correspondences are much less dependable and less consistent (Fender, 2008). Spelling words is much more difficult in deep orthographies such as English. Deep orthographies require writers to depend less on letter- by- letter writing and instead use group of letters, morphemes and lexical information that is unique to each word. Orthography or spelling system of a language is either shallow or deep. In a shallow orthography there is much closer correspondence between spelling and pronunciation than in deep orthography. English language orthography is considered to be deep, with a complex syllable structure which influences pronunciation of vowel sounds, as well as having inconsistence grapheme-phoneme relationships both in terms of spelling and pronunciation (Liu, 2015).

The deep orthography of English presents an extensive challenge to L2 learners because of its high degree of irregularity. Many English letters can correspond to more than one sound, for instance, letter *c* can correspond to sound /k/ as in *car* and also the sound /s/ as in *certain.* In addition, many sounds can be represented by one letter in English language. In addition, English has a number of consonant diagraphs (combination of consonants that are pronounced as a single sound unit) such as *th, sh, ch* and *ck*, in which two graphemes are used to represent a single sound. These one-to-many and many-to-one

relationships between graphemes and sounds in the orthography of English make spelling of words difficult especially for learners whose first language has a shallower orthography (Miller, 2019).

Spelling is a complex, language-based skills that involves the production of the correct orthographic representation of a written word. Research has indicated that various linguistic knowledge sources provide the base for spelling competence and word knowledge (Bourassa & Treiman, 2001). These linguistic foundations consist of knowledge and competence in orthography, phonology and morphology, as well as clear and succinct mental graphemic representations (MGR). These linguistic levels play significant roles in the advance individual's spelling skills. Learners must be able to apply these linguistic skills as they write in order to be successful spellers. Knowledge on how to spell words accurately is dependent on the same fundamental linguistic representations involved in knowing how to read a word (Ehri & Wilce, 1982). Failure to spell words correctly results to spelling errors which may occur when a word that does not match the target word in part or in full is marked as misspelling. Each erroneous grapheme (vowel, consonant, vowel/consonant diagraphs, phonographs, prefix or suffix) within a word is considered as an error. In other words, an error is a word composition that does not follow the rules of the target language (Al-Jarf, 2010).

2.4.1.5 Vocabulary Processing Knowledge

Vocabulary knowledge is the ability to define words, word knowledge and the skill to recognize situations appropriate for using words (Cervetti et al., 2012). Vocabulary knowledge incorporates a wide range of other linguistic features such as: orthography (spelling), phonology (pronunciation), morphology, meaning, syntactic, collocation, register, frequency of the word and pragmatics (Moinzadeh & Moslehpour, 2012).

Taking these features into consideration, Nation (2001) proposed that vocabulary knowledge comprises three dimensions: form (oral and written), meaning and use.

In addition, Taylor (2004) proposed eight dimensions of vocabulary knowledge: (a) the written form of a word (b) the spoken form of a word (c) the association the word has with other words (d) the stylistic register constraints of the word (e) the frequency of the word (f) the collocational nature of the word (g) the conceptual meaning of the word and (h) the grammatical nature of the word.

Vocabulary knowledge has two dimensions; *breadth* and *depth*. Breadth of vocabulary refers to the quantity or number of words learners know at a particular level of language proficiency. It is the size of learner's vocabulary; the number of words a learner has at least the knowledge of. The learner needs to possess a minimal knowledge of the meaning of words that involve knowing the oral and written forms of words, the surface meanings and basic use of words (Stæhr, 2009). It is the basic dimension of a learner's lexical competence. Learners with large vocabulary size are more proficient language users than learners with smaller vocabulary size. The size of vocabulary is such a crucial part of language proficiency (Meara, 1996).

Vocabulary depth, on the other hand, is defined as the quality of the lexical knowledge that reflects how well a learner knows individual words or how well words are organized in the learners' mental lexicon (Read, 2016). It also refers to the quality of lexical knowledge or how well a learner knows a word (Nation, 2000). In addition, it is what the learner knows about the word; word associates, collocation, derivation and word's function. Li and Kirby (2015) observe that word depth cover components like pronunciation, spelling, meaning, register, frequency, morphological, syntactic and

collocation properties.

There have been different approaches to conceptualize and measure the depth of vocabulary knowledge. Some researchers have viewed depth of vocabulary as mainly involving the knowledge of word's different sense relations to other words in lexicon (Chegeni & Tabatabaei, 2014; Meara, 1996). This approach attempts to define depth of vocabulary as the degree to which lexical networks have been established and from the dimension of word meaning and collocation.

Morphological information has been suggested as another feature of depth of vocabulary knowledge. Affixes and roots can assist learners understand information of words which enhance their cognizance in relation to other words, also act as a binding agent that integrate meaning with orthography and phonology. (Kemp, 2009).

Li and Kirby (2015) posit that structurally and functionally, breadth and depth of vocabulary are interconnected. In that, in the process of reading, the breadth and depth of vocabulary interrelate with one another so that the best results of the use of vocabulary can be realized. In short, these two dimensions operate interactively and interdependently and, in this way, they deserve equal attention while exploring the role of vocabulary knowledge in reading comprehension.

Raudszus, Segers, and Verhoeven (2017) contend that reading comprehension depends on having knowledge of words; their orthographic, phonological and semantic constituents. Therefore, reading comprehension improves when the reader has more high-quality representations of words and can draw simultaneously upon their understanding of their form and meaning. The integration of lexical knowledge takes time to develop because vocabulary and orthography learning occurs gradually with repeated exposure to

words (Kida, 2016). Thus, there should be continuous learning of these skills in secondary schools long after phonological cognizance (Berninger et al., 2006).

Mehrpour, Sadighi, and Bagheri, (2012) investigated the specific role learners' vocabulary knowledge plays in their reading comprehension performance. They also examined whether there was a relationship between the breadth and depth of vocabulary. The results showed that breadth and depth of vocabulary knowledge are significantly correlated with reading comprehension.

Zhang and Anual (2008) studied the role of vocabulary in reading comprehension among 37 secondary school learners. The findings showed that learners' vocabulary knowledge had a significant correlation with reading comprehension. They concluded that limited vocabulary breadth and depth as well as lack of adequate knowledge of word meanings impede learners from comprehending the meaning of the text. They also observed that breadth and depth of vocabulary knowledge should be viewed as a knowledge continuum rather than two distinct dimensions of lexical development.

A study carried out by Rashidi and Khosravi (2010) to investigate the role of breadth and depth of vocabulary knowledge among 38 senior university learners found a significant and positive correlation between vocabulary knowledge and reading comprehension. They found that learners with more breadth and depth of vocabulary knowledge perform better in reading comprehension.

According to Teng (2016), vocabulary knowledge is a significant predictor above and beyond decoding, and visual word recognition in the prediction of reading comprehension. Limited vocabulary or inability to access vocabulary knowledge efficiently leads to poor reading comprehension. Meaning construction from reading

comprehension depends heavily on the richness of the learner's semantic and conceptual system.

These two dimensions, that is, breadth and depth of vocabulary have a significant independent relationship with reading comprehension performance. There is evidence from correlated- based and experimental L2 studies that vocabulary size is closely related to reading comprehension (Stæhr, 2009).

2.5 Theoretical Framework

We now turn our attention to the theory that informed the present study in terms of understanding and depicting our subject of study, as well as giving analytical focus to enable the analysis and interpretation of the data collected. The main focus of this study is to examine the influence of reading comprehension skill activities onschema (background knowledge) of the English second language learners' performance in reading comprehension and to examine the meaning of erroneous answers obtained from their reading comprehension assessment passages. This section presents the theoretical framework that guide the study. There are three theoretical procedures used in reading comprehension that have been identified: bottom-up, top-down and interactive (Whitney, 1987).

2.5.1 Bottom-up Theoretical View

This theoretical view is at word level. It confines the reader to the text and emphasizes recognition of words rather than meaning. This is the theoretical view used during the early stages of reading with beginners**.** The main focus is that the reader starts with decoding the smallest linguistic units of phonemes, graphemes, words then sentence (Carrell & Eisterhold, 1983). It emphasizes on developing the basic reading skills of phonic, that is, matching sounds with letters, syllables and words written on page (an

awareness of sounds that make up spoken words). It concentrates exclusively on what is in the text itself.

Most reading comprehension activities at word level are based on recognition and recall of lexical and grammatical forms that emphasize on decoding. It concentrates on literal comprehension. The ideas, facts and information are explicitly stated in the text. It gives no importance to the readers' knowledge or experience on the subject matter (Debat, 2006). However, this view was criticized for under-estimating the contribution of the reader to the text.

That is, it is not possible for the reader to keep every meaning of words in the text in memory; it separates the text into isolated parts which prevents the reader from interacting with the writer. These limitations made researchers to start to consider reading as an active process and began to reflect the importance of active readers and use of background knowledge in reading process (Carrell, 1984).

2.5.2 open-down Theoretical View

This view is also known as concept-driven reading view. Under this view, readers focus on identifying the text words and finding the words associated with the text concepts. Readers also reflect on the topic of the text that permits them to restrict the scope of their reading. Then they assume the message the writer wants to transfer and change their hypotheses based on what they have read from the text. The view assumes that reading is a process in which readers make predictions about a text, according to their prior knowledge, experience and then read the text to confirm on these predictions (Gilakjani and Sabouri, 2016a). We call this reading, 'beyond the word' or 'reading between the lines.

According to Khanam et al., (2014) in a top-down view, readers use their knowledge of syntax and semantics to reduce their dependence on the print and phonics of the text. The readers do not process a text by decoding every word in it instead they predict the meaning by the use of their own prior knowledge. The view assumes that reading is 'a psycholinguistic guessing game' in which readers relate their prior knowledge with the text information in order to comprehend (Gurses & Adiguzel, 2013).

Sadoski and Paivio (2007) posit that the top-down view involves the knowledge the reader brings to the text which enables him/her to actively participate during the reading process that aid the reader in making and testing hypotheses about the text. In supporting this view, Carrell (1984), observe readers as active participants who make predictions and verify the predictions by processing the written information. Therefore, the text and the reader become important concepts in the reading process.

Calderón (2011) concluded that effective reading requires both background knowledge and linguistic knowledge to function together. If there is a problem with either, the other compensates. In this view, reading is not just extracting meaning from the text but a process of connecting information in the text with the knowledge the reader brings to the process of reading. Reading becomes a dialogue between the reader and the text. It is seen as an active cognitive process in which the readers' background knowledge plays a key role in comprehending the text (Debat, 2006).

An (2013) questioned what the top-down theoretical view advocate for, in that, the view does not describe what less proficient and developing readers do; it seems to describe what skillful and fluent readers do, for whom decoding has become automatic. However, the view has its limitations. It makes comprehension to be a guessing game which

prevents predictions from being confirmed.

In these two theoretical views, the term ‘bottom’ refers to the physical text, whereas the term ‘top’ refers to higher order mental concepts, such as the prior knowledge. Comprehension starts with high levels of processing and continues to the application of lower levels (Neufeld, 2005). A more effective process reading model was proposed, which combined both bottom-up and top-down models. The model is called the interactive model.

2.5.3 The Interactive Theoretical view

2.5.4 Schema Theory

Schema (plural form: schemata) is referred to as background knowledge or script, plan or framework (Al-Issa, 2006). It is a technical term used in psychology by cognitive scientist to describe how people process, organize and store information in their heads (Rumelhart, 2013). Schemata are created through experience with people, objects and events in the world.

Schema has diverse history, with its origin in philosophy and cognitive psychology. Scaglia (1996, p. 27), a German philosopher contends that only when new ideas, concepts and thoughts related to one’s background knowledge become meaningful in reading context. He defines schema as ‘innate structures, which organize our world.

In 1932, a German gestalt psychologist Barllet advanced schema to schema theory to further expound on how background knowledge is used by reader/listener to comprehend and recall a text. He defined it as ‘an active organization of past reactions of past experiences, which must always be supposed to be operating in any well adapted organic response’ (Barllet, 1932, p.78). That is, one will have responses akin to what he or she

had before in a similar situation. Learners' reading comprehension mostly depend on their background knowledge structure (Bartlett, 1932). In 1932, Barllet published his famous book '*Remembering*' which covered a more detailed explanation of his empirical findings. The scholar suggested that readers' comprehension and recall of events is formed by their anticipations or prior knowledge and that these anticipations are presented mentally in some sort of schematic way. Bartlett (1932) notions were criticized for being too unclear to be combined with any form of testable theory. The absence of exact definition isolated different conflicting interpretations of his work. Barllet's concepts were secluded by the impending wave of behaviorism, until a return of a more naturalistic approach to human memory in the 1970s revived his concepts. Computational models made it probable to check Barllets 'unclear concepts' to understand the basic constituents of schemata.

The notion of schema expanded gradually and adapted in different situations without altering its essential nature (Rumelhart,2013, p.24). Rumelhart, introduced the theory to reading comprehension skill as 'an explanation on how readers use prior knowledge and learn from the text' or 'a data structure for representing the generic concepts stored in memory' (Rumelhart,2013, p.24). In addition, the theory is considered to be a theory about knowledge: how knowledge is represented and organized, how that representation and organization facilitates the use of reader's prior knowledge to improve reading comprehension. Thus, schema is the organizational knowledge that one has about people, objects, places, events, processes, concepts and basically everything that provides a basis for learning (Rumelhart, 2005).

In addition, Rumelhart defines schemata as the representation of knowledge at various levels starting from the ideological and cultural dimension of the meaning of a particular

word to and the connotations attached to them as well as the general knowledge (p 41). Rumelhart and Ortony add the following:

Schemata are data structures for representing the generic concepts stored in memory. They exist for generalized underlying objects, situations, sequence of events, actions, and sequences of actions. A schema contains as part of its specifications, the network of interrelation that is believed to hold among the constituents of the concept in question (p. 101).

The schema-theoretical approach to the analysis of reading comprehension process has had a profound impact on the study of reading comprehension. According to this theory, reading comprehension is an interactive process in which the writer's perspectives, ideas, intentions and conclusions are all interpreted through the reader's experience, cultural background and predispositions (McVee et al., 2005).

Simply put schema is 'a general knowledge structure used for understanding' (An, 2013, p.11). The cognitive development of a reader changes his schemata and organize information into long term memory. Schemata is always modified by new experiences from reading or from daily life affairs (Day and Park, 2005).

The fundamental tenet of schema theory assumes that a written text does not carry meaning assumed by it. Rather a text only provides directions for readers on how they should retrieve or construct meaning from previously acquired knowledge. Schemata are seen as cognitive constructions that reflect the experiences, conceptual understanding, attitudes, values and strategies brought to a text situation (Kirby, 2007).

The theory is based on the belief that every act of comprehension involves one's

knowledge of the world (Stoller et al., 2013). Comprehending words, sentence and entire text involves more than applying one's linguistic knowledge. The more knowledge one has on the topic of the text the better the comprehension of the text one gets (Khanam et al., 2014).

According to schema theory, the process of interpretation is guided by the principle that input is mapped against some existing schema and that all the aspects of that schema must be compatible with the input information. Readers understand what they read because they are able to take the stimuli beyond its graphic representation and assign its membership to an appropriate group of concepts already stored in the memories. During reading the reader brings information, knowledge, emotions, experiences and culture to the printed word to make decisions on what something means (Carrell & Eisterhold, 1983).

Understanding a text depends on how much schema readers possess while reading. Readers' failure to understand a text is caused by lack of appropriate schema that can easily fit with the content of the text. A text only provides directions for listeners or readers on how they should retrieve or construct meaning from their own, previously acquired knowledge. Such knowledge is called the reader's background knowledge; the previously acquired structures are called schemata (Gilakjani and Ahmadi, 2011). Carrell (1984) describes three main areas of schemata connected to reading comprehension, linguistic schemata, formal schemata and content schemata.

Linguistic schemata refer to the knowledge of the letters and their corresponding sounds both alone and in their clusters and the ability to predict, through knowledge of syntax, the word or words that will follow. This schema is extremely essential in decoding and

understanding a text while reading. The more linguistic schemata are in the reader's mind, the faster the reader can acquire information and comprehend.

According to Hu (2012), linguistic schema refers to knowledge of phoneme, vocabulary, phrase, sentence structure, paragraph, grammar and cohesion of a text. Hu adds that linguistic schema plays a basic role in comprehending a text. It is the first step in the whole reading process, during which the reader mainly focuses on the meaning of words and syntax.

Li and Zang (2016) posit that linguistic schemata refer to reader's existing language proficiency in vocabulary, grammar and sentence structure that plays an important role in understanding of the text. Li and Zang added that without basic language knowledge no reading activity or skill can function effectively. Therefore, the more linguistic schemata readers have in their mind the more information the readers may acquire from the text and more effective they become. Therefore, linguistic schema is prerequisite for reading comprehension and basis for content schema and formal schema.

The second type of schemata is formal schemata. Formal schemata refer to the way the texts differ from one another; knowledge of rhetorical patterns and organizational forms in which information in the text is written. For example, a reading text could be a fictional work, a letter to the editor or a scientific essay and each genre will have a different structural organization. Knowledge of different kind of genres aid comprehension, as it gives readers a basis for predicting what text will be like (Carrell & Eisterhold, 1983).

Formal schemata are described as mental, encoded, internalized, coherence patterns of meta- linguistic discourse and textual structure that direct expectation in our efforts to comprehend a text. Readers use their schematic representations of the text such as

fictions, poems, essays, newspapers, academic articles in journals and magazines to assist understand the information in the text (Al-Issa, 2006).

Lack of genre knowledge contributes considerably to problems in reading comprehension. For example, if a reader lacks formal schemata underlying a narration setting, time, place, characters identification followed by events leading towards a reaction such a reader will have difficulty in comprehending the story (Al-Issa, 2006). Research on formal schemata clearly suggests that texts with familiar structure organization should be easier to read and comprehend than texts with unfamiliar structure organization (Martinez-Adrian & Gallardo-Del-Puerto, 2017).

The third type of schemata is content schemata. Content schemata refer to the message of the text. One's familiarity with background knowledge or content of the text makes the reader more productive and efficient. The reader is able to comprehend a message when he is able to bring to mind a schema that gives account of the objects and events described in the reading comprehension passage (Anderson, 1994). Content schemata is the background knowledge of the content area of the text (Elbro and Buch-Iversen, 2013). If the reader possesses the content schemata presupposed by the text, it is likely that comprehension of the text will be easier. Content schemata is the background knowledge a reader brings to a text which is closer to the text content (Pardo, 2004).

Oller (1995) observes that content schemata are developed through our experiences and perception of the reality surrounding us. For example, content schema for going to a restaurant would include information about services, menus, ordering dishes, paying bills, giving tips and so on (Al-Issa, 2006). Language is not only the simple combination of

vocabulary, grammar and sentence structure, but also a bearer of different levels of the culture. Therefore, the content schemata can facilitate the readers' comprehension of a text, enabling them to predict, choose information and remove ambiguities (Hu, 2012).

Carrell and Eisterhold reiterate Schema theory outlines the process of comprehension founded on the principle that there is an input-output mapping where all aspects of that schema output must have corresponding input information. There are two basic modes of information processing: bottom-up and top-down which result from schema. (557). Carrell and Eisterhold make a further a distinction between a formal schema that represent the background knowledge of the formal, rhetorical organizational structures of different types of texts and content schema that represent the background knowledge of the content area of a text (560). Rumelhart and Ortony add that have following attributes: i) schemata have variables ii) schemata can embed one within another iii) schemata represent generic concepts which are characterized by variation in the different levels of abstraction iv) schemata represent knowledge rather than definition. (101)

In their study, Martinez-Adrian and Gallardo-Del-Puerto, (2017) conducted an experiment to investigate effects of ESL reading comprehension of both culture specific content schemata and formal schemata. The study found that familiar content and familiar formal structure yielded good reading comprehension ability while unfamiliar content and unfamiliar formal schemata yielded poor reading comprehension ability. The findings also indicated that content schemata influenced reading comprehension to a greater extent than formal schemata.

Schema theory research shows that the greater the background knowledge of a text's content area, the greater the comprehension of the text. The implication of this, is that

some learners reading problems may be problems with insufficient background knowledge (Gilakjani and Ahmadi, 2011).

Research on content schemata suggests that texts on content from the participants' cultural heritage, that is, texts with familiar content, should be easier to read and comprehend than texts on content from a distant, unfamiliar cultural heritage. Teachers of ESL reading need to be aware of the important role in ESL reading background knowledge of the text content, especially cultural content (Li and Zang, 2016).

To some degree, content schemata can compensate for the absence of linguistic schemata and hence assist learners comprehend a text by predicting, selecting information and eliminating ambiguities (Pearson, 2009).Carrell, (1984) pointed out that learners might have sufficient schemata, yet not be able to comprehend a text, if those schemata are not appropriately activated. The hall mark of schema theory, with regard to reading comprehension, is that, a text does not by itself carry meaning.

The reader brings information, knowledge, emotion and culture to the printed word (Al-Issa, 2006). Al-Issa added that more information is contributed by the reader than by the text. Therefore, understanding of a text depends on how much related schemata readers possess while reading. The reader's ability to apply already existing background knowledge to the information already derived from the text is crucial to reading comprehension (Alyousef, 2006).

One of the most obvious reasons a particular schema may fail to exist for an ESL reader is that the schema is specific to a given culture and is not part of the reader's background knowledge. Implicit cultural background presupposed by a text and the reader's own cultural background knowledge interact to make texts based on one's culture easier to

read and understand than syntactically and rhetorically equivalent texts based on a less familiar, more distant culture (Al- Issa, 2006).

Alyousef (2006) asserted that in reading comprehension readers interpret what is being read by relating and matching it to their existing schemata. ESL learners are faced with difficulty of comprehending in second language texts that contain cultural assumptions of target culture. Therefore, learners may lack the culture-specific background knowledge necessary to comprehend a text (Cohen, 1996).

In activating and building schemata Ghafournia (2014) noted that when readers cannot locate a schema that fits the text, they may find it incomprehensible. In some cases, readers may not have a schema that is significant to the text they therefore need help to activate the pertinent schema to comprehend the text. The teacher must be ready to engage in building background knowledge as well as activating existing background knowledge. Stoller et al., (2013) added that it is the responsibility of the teacher to activate pre-existing schemata, help the learners to integrate isolated 'parcels' of knowledge into schemata or to build a new one.

The three types of schemata contribute to overall ESL text comprehension, both separately and cumulatively although to different extent. Schemata inducing activities improve reading comprehension by activating reader's appropriate schemata and this has an effect on overall text comprehension performance (Al-Issa, 2006).

In summary formal, content and linguistic schemata make readers predict events as well as infer meaning from the wider context. If the topic is familiar, the reading task will be more productive and efficient (Debat, 2006).

The dimension of overall reading comprehension in the present study was assumed to be the result of an interaction of the three types of schemata; linguistic schemata (skills of decoding and discourse processing); content schemata (knowledge related to the content domain of the text); and formal schemata (familiarity with the rhetorical patterns in which information is presented).

2.5.4.1 Relevance of Schema Theory to Reading Comprehension

Research in schema theory seem to agree that when learners are familiar with the topic of the reading text (i.e., possess content schema), are cognizant with discourse level and structural make-up of the genre of the text (formal schema) and are competent in decoding features needed to recognize words structure in sentences (possess linguistic schema) they are in better position to comprehend their reading comprehension tasks. Inadequacy in any of these schemas will result in reading comprehension failure. However, learners might have adequate schemata, yet, unable to comprehend if such schemata are not appropriately activated (Xiangying, 2020).

In applying the schemata theory effectively in teaching second language reading comprehension, the teacher has a role to activate and build schemata. To achieve this, he/she should in advance select texts that are relevant to learners' needs, preferences, cater for individual differences and culture in order to provide meaningful texts, so that learners can understand the message, which entails activating existing schemata and helping in building new schemata. After selecting the text, the teacher needs to carry out three phases of reading comprehension skill activities (pre-, while- and post-reading) to activate and build the learners schemata (Hwang, 2008).

Various activities can help the teacher introduce key vocabulary and reinforce concept

association to activate both formal and content schemata. Formal schemata will be activated by employing reading comprehension skill activities such as previewing to draw attention to the structure of a text. The content schemata will be activated by using various reading comprehension activities to help learners brainstorm and predict how the information fits in their previous knowledge (Al-Issa, 2006).

The schemata of the learners were taken into consideration during the selection of reading comprehension passages of the present study. First, words and sentences were of length and structure that learners could comprehend. This was to take care of their linguistic schemata. Second, the reading comprehension passages were both fictitious and non-fictitious to take care of their formal schemata. Finally, the reading comprehension passages content was of topical and cultural knowledge of the learners to take care of their content schemata.

2.4.2 Features of Schema Theory

Accretion: This involves situating new information into the old (existing schema) without any alteration. Mcvee & Gavelek, (2005) referred to this as schema instantiation. That is, new information is remembered in the context of an existing schema, without changing that schema. **Alteration:** This involves existing schema undergoing modification in order to accommodate the new information. New information or experience cannot be fully accommodated under an existing schema, so the schema evolves to become more consistent with new experience.

Restructuring: When new information cannot be accommodated simply by modifying an existing schema, it results in creation of a new schema. This takes place when the reader cannot make sense of what is being read using the existing schema.

2.5.4.3 Schema Activation and Construction

Their comprehending depends on reader's schema, the closer the schemata match the schemata intended by the writer, the easier it is to comprehend the text (Khaghaninejad, 2015). Schemata activation is generally recognized as the process in which some textual signal the direction or area for the reader to look for and arouse the relevant schema from memory into the present reading task (Mai, Ngoc & Thao, 2014). Texts are certainly not completely explicit; therefore, the reader must rely on pre-existing schemata to provide reasonable interpretations. Researchers have suggested different ways to help learners activate and use their prior knowledge to aid comprehension. For example, reciprocal teaching, metacognitive strategy use, scaffolding among others.

Schemata construction is a mental process of creating a new schema if new information cannot be accommodated by an existing schema. For example, someone may hold the belief that balls are round and are made to bounce. However, he may encounter a *bowling ball* that is solid and has holes drilled into it for the purpose of rolling rather than bouncing. This new knowledge is integrated into a new, more complex mental structure about the shape, form, substance and functions of the balls. As a result, new knowledge of schema or mental structure is formed. Reading comprehension activities promote schemata activation and construction in order to comprehend and interpret text better (Fournier & Graves, 2002).

2.5.4.4 Assumptions of schema theory

The schema theoretic model of passage comprehension is premised on the assumption that: one, effective comprehension requires that the readers integrate their knowledge of the world with the linguistic material that they encounter. Two, reading processes are universal across languages, that is, no matter what kind of language. the readers are

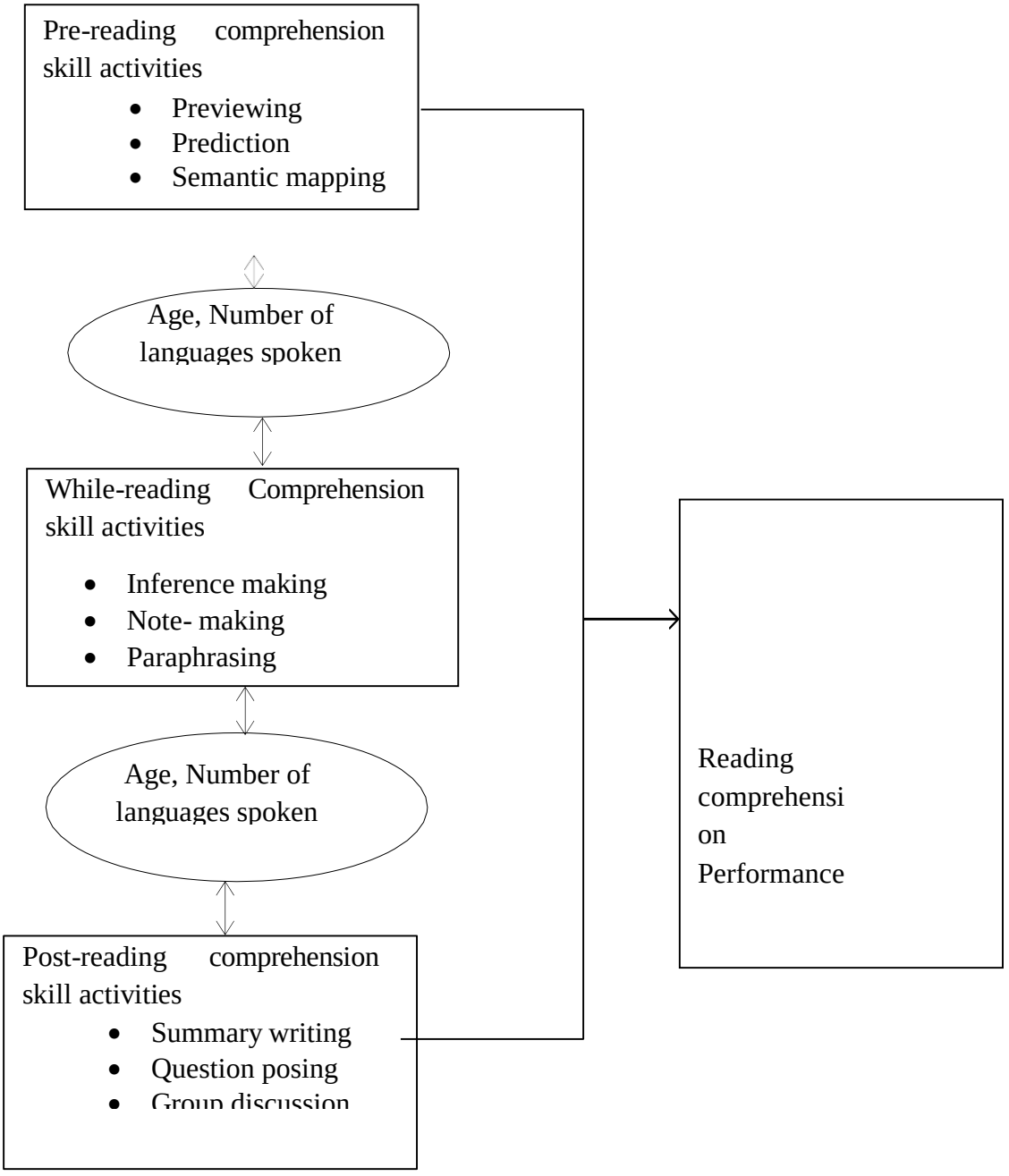
reading in, there is only one way of reading, and that is the use of selecting, sampling and predicting information based on minimal graphic cues. Three, in L_2 research, no clear distinction is made between general L_2 proficiency and lower-level processing abilities (Koda, 2005). Four, the lower-level processing skills are simple by- products of language proficiency and that as learners' overall language competence increase their ability to process textual information naturally improved as well.

The schema theory view emphasizes the role of higher -level conceptual and background knowledge as sources to reading comprehension while bottom-up and top-down theoretical views contribute to lower- level sub-components of reading comprehension.

2.6 Conceptual Framework

The underlying assumption of this study was that reading comprehension skill activities determine the reading. The study was, therefore, conceptualized as an examination of variables (reading comprehension skill activities) that determine the reading comprehension performance.

In this framework, therefore, this study's variables as well as hypothesized relationship between the variables is illustrated. The predictor/intervention variables were previewing, prediction, semantic mapping, inference, note-making, paraphrasing, summary writing, questioning and discussion. The outcome variable was reading comprehension performance which was inferred from reading comprehension assessment passage scores. The intervening variables were age and number of languages spoken by learners. Figure 2 below summarizes this information.



Key:

⟷ Interactions

⟶ Direction of influence

***Figure 2*: Conceptual Framework Showing Relationship between Variables**

Learners' reading comprehension performance was hypothesized to be determined by reading comprehension skill activities. The predictor variables may interact with the intervening variables (age and number of languages spoken) to influence reading comprehension performance.

2.7 Summary

This chapter presented a review of literature from which the issues of concern for the present study have been expounded and grounded. Schema theory has been presented as the major theory within which the data was collected. The theory was adopted as it fits adequately within the holistic and interactive view of reading comprehension, the base of this study. The next chapter discusses the methodology that guided the study in data collection procedures and procedures adopted in analysis of data.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter present discussion of the methodology adopted for the present study. It begins with research design and then presents the population and area where the study was undertaken. This then paves the way for a discussion of the study sample in terms of the sampling design, sample size and procedures used to obtain the study sample. The data lection methods, instruments and procedures as well as ways of presenting data. The chapter ends with a look at the ethical and confidentiality issues that the study had to address.

3.1 Research Design

A research design is defined as the plan or the structure of investigation that is used to gather and analyze data with the aim of answering the research questions set for a study. A research design therefore gives the arrangement of conditions for collection and analysis of data. This is done in a manner that aims to combine relevance of the research purpose with the research procedure (Kothari, 2004).

In this study, an experimental design using a mixed method approach was used for data collection. This approach was used to examine how reading comprehension skill activities determine reading comprehension performance quantitatively. In addition, a qualitative content analysis approach was adopted to examine the comprehension erroneous answers obtained from reading comprehension assessment passages.

Mixed methods approach research is the type of research where the researcher combines techniques, methods, approaches, concepts or language into a single study (Hashemi &

Babaii, 2013). In addition, 'Mixed methods research involves mixing or combining quantitative and qualitative approaches, concepts or language into a single study' (Johnson & Onwuegbuzie, 2004, p.17).

Qualitative research is not concerned with numerical representative, but with the deepening of understanding of a given problem. The aim of qualitative methodology is to produce in-depth and illustrative information in order to understand the various dimensions of the problem under investigation (Anney, 2014).

Smollan and Parry (2011) posit that qualitative research works with the universe of meanings, motives, aspirations, beliefs, values and attitudes which corresponds to deeper space of relationships, processes that cannot be reduced to quantitative measurable variables. On the other hand, quantitative research focuses on objectivity and is especially appropriate when there is possibility of collecting quantifiable measures of variables and inferences from sample of population.

Hashemi and Babaii (2013) argue that mixed method research helps to develop rich insights into various phenomena of interest that cannot be fully understood by using only a quantitative or a qualitative method. Mixed methods approach encourages the use of multiple world views by combining inductive and deductive thinking which helps to answer research questions and provide more comprehensive evidence in numbers and words for studying research problems than either quantitative or qualitative method would do (Jewitt & Bezemer, 2010).

3.1.1 Rationale for Mixed Method Approach

On the onset of this study, I planned to employ quantitative method to collect and analyze

the data. However, it was not until I read the erroneous answers from the reading comprehension assessment scripts that I realized the phenomenon was worth examination through qualitative method. For that reason, I decided to adjust the research methodology from purely a quantitative one to a mixed method approach. Both quantitative and qualitative approaches were used in the study in order to gain a fuller picture and deeper understanding of the examined phenomenon and to expand the study's scope and focus.

Experimental design was used to collect quantitative data and qualitative content analysis was done on erroneous answers obtained from the reading comprehension assessment passages. One major advantage of quantitative method is its ability to obtain results that can be generalized widely. However, quantitative method can be limited as it tends to measure limited number of outcomes and therefore detailed issues are not examined more deeply (Riazi & Candlin, 2014). It is for these reasons researchers apply qualitative methods to explain what statistical measures may fail to explain. The quantitative data of the present study was collected by use of an experimental method.

3.1.2 Experimental Design in this Study

Experimental design is a scientific and systematic approach to research in which experiments are carried out to examine the relationship between variables. (Cohen et al., 2007). It is a conceptual framework within which the experiment is conducted. It has two functions: One it establishes the conditions for the comparisons required to test the hypotheses of the experiment and two it enables the researcher, through statistical analysis of the data, to make a meaningful interpretation, more reliable, quantified and statistically measured results of the study (Brown, 2008).

The purpose of an experimental design is to enhance control of extraneous variables and draw conclusions about effects of one type of variable upon achievement. Experimental designs enable patterns of results to be directly associated with certain effects of an independent variable (Orodho, 2003). In this study, two-group simple random design; a principle of experimental design was used. First the population was defined from which a sample was selected. From the sample the learners were randomly assigned to experimental and control groups. The experimental group received reading comprehension skill activities intervention and the control group had the conventional teaching as shown in figure 3 below.

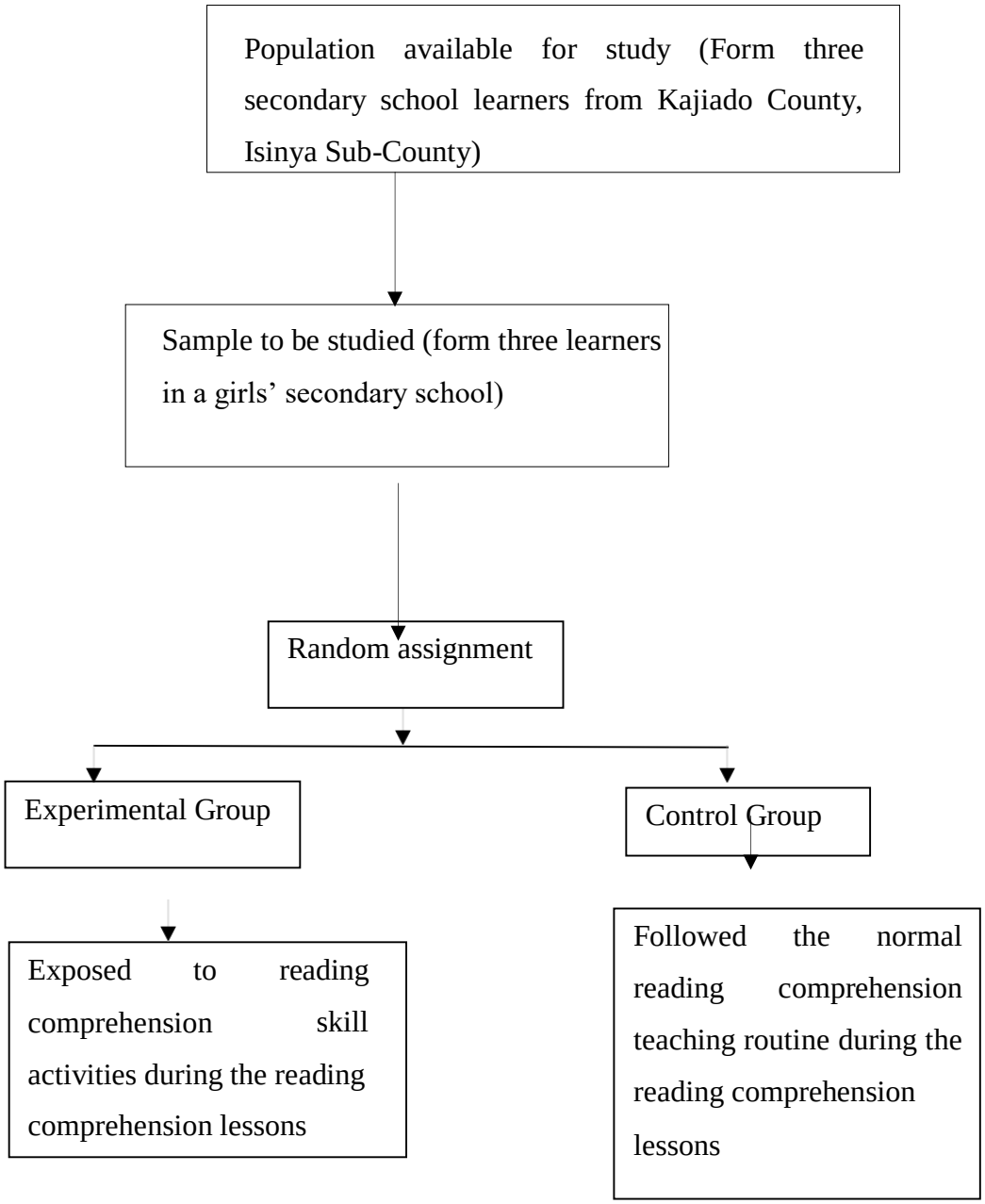


***Figure 3*: Random Sampling Design Source:**

Researcher, (2019)

3.1.2.1 Internal Validity of the Experimental Design

Experimental research is measured according to two criteria: internal validity and external validity. Internal validity has to do with threats that affect the dependent variable. The degree to which an experimental study results are accredited to the independent variable and not to any other comparable variable is the degree to which an experimental study is internally valid (Elbro and Buch-Iversen, 2013).

The internal validity of the experimental design of this study was ensured by one; use of the same English teacher, this controlled extraneous variables that could affect internal validity if a different teacher was used. Two, same reading comprehension assessment passages were used to assess both the control and the experimental groups. Three, learners' background characteristics in terms of age, number of languages spoken were the same. Four, learners were of the same gender. Five, learners were randomly assigned to experimental and control group to ensure that each learner had an equal opportunity and independent chance of being assigned to any group. This increased the probability that the participants of the two groups were similar on any relevant extraneous variables such as aptitude, socio-economic level, motivation and other relevant variables the researcher had not envisaged. If related variables that may affect independent variable are not controlled, they are threats to the internal validity of an experiment as the results obtained are not due to the intervention only and therefore, they cannot be generalized widely (Hansen & Pearson, 1983).

External validity deals with the extent to which the study results can be generalized to groups or settings other than the ones used for the experiment. An experimental research study is said to have high external validity if its results can be replicated in different settings by other researchers. By use of classroom set up, the present study can be replicated in other school classrooms.

3.1.3 Research Variables

Experimental research has three main variables; dependent, independent and intervention. Dependent variable receives stimulus and is measured for the effect the intervention has had upon it. The independent variable is the feature/ treatment or intervention considered to bring about a difference to a dependent variable. The difference may be measured by a test. In other words, the researcher change (manipulate) one or more independent variables and monitor the

effect of the independent variable(s) on one or two dependent variable(s) (Elbro and Buch- Iversen, 2013). In experimental designs, researchers deliberately and explicitly manipulate the variables in order to prove or disprove his hypothesis (Li, 1988).

This study had nine independent variables categorized in three phases (pre-, while- and post- reading phases) in each phase there were three variables. The pre-reading phase variables were; previewing, prediction and semantic mapping; while-reading phase variables were; inference making, note-making and paraphrasing; post- reading phase variables were; summary writing, question posing and group discussion reading comprehension skill activities. These were the forms of interventions exposed to the experimental group. In other words, these were the predictor variables that were used to draw conclusions on their relationship and predictive value with the outcome variable (reading comprehension performance).

3.1.4 Intervention Phase

This phase involved exposing the learners in the experimental group to reading comprehension skill activities intervention in order to activate their schemata and later examine their reading comprehension performance. During the first week, reading comprehension passage 1 was used to teach pre-reading comprehension skill activities (previewing, prediction and semantic mapping). Week two, the same passage was used to teach the while-reading comprehension skill activities (inference making, note-making and paraphrasing). In week three, the passage was used to teach the post- reading comprehension skill activities (summary writing, question posing and group discussion). In week four, five and six; reading comprehension passage 2 two was used and followed the same teaching procedure as in week one, two and three mentioned above.

3.1.5 Implementation and Reliability of Teaching

All teaching in both experimental and control groups were conducted by the lessons' ordinary teachers during the six lessons of approximately forty minutes each. This was to control the differential effects of the extraneous independent variable that could occur if different teachers taught the two groups (Kothari, 2004).

The two participating teachers were given a brief introduction to the aims and the plan of the study. Each teacher was provided with teaching materials (reading comprehension passage and lesson plan) prior to the lesson for experimental groups.

The conventional teaching of the control group was done before the teaching of experimental group. This way, the experimental teaching was relatively controlled to ensure reliability of the teaching. The learners were informed why they were randomly assigned to two groups, that is, they were aware that research on reading comprehension skill activities was being carried out.

3.1.6 Study Area

This study was carried out in Isinya Sub-County of Kajiado County, Kenya. The Sub-County has various categories of schools namely: national, county, sub-county and day schools. The sample population of this study was drawn from County girls' secondary school.

3.1.7 Target Population

Target population refers to a larger group of elements from which a sample is taken from. It is the population in which the study seeks to generalize its findings (Cohen et al., 2007). This group also contains elements that meet some certain criteria for inclusion

in a study. This study was carried out in two public county girls' secondary schools, namely, Moi girls, Isinya and Noonkopir girls. This was because the schools had to be homogenous in gender and type due to the experimental nature of the study. I was familiar with the area making it easy to monitor the groups during the six weeks of the intervention.

3.1.8 Sampling Techniques and Sample Size

This study used simple random sampling, a procedure which provides equal opportunity of selection for each element of the population (Kothari, 2004). Isinya sub- County has 4 County girls' public secondary schools. Simple random sampling was used to get two schools. Then, a simple random sampling was done to get one form three class from each school. The learners of the sampled classes were randomly assigned to either a control or experimental group. This was to ensure that the individual differences among learners were being randomized. In line with this, the control group consisted of 34 learners and the experimental groups consisted of 39 learners. An average of two learners was absent either at pre-test, process assessments or post-tests and they were considered as drop outs. The groups were homogenous in terms of gender, age range and number of languages spoken.

3.1.9 Pilot Study

A pilot study was conducted on a random sample of 25 form three girls from one public county secondary in Isinya Sub County. The school used for the pilot study did not take part in the main study. The pilot study was necessary, so as to pre-test the research instruments and ensure that they were clearly worded, the questions were understandable and the time allocated was reasonable, this enhanced the validity and reliability of the instruments. During the pilot study, the researcher administered the research instruments

in a similar manner and sequence like that would happen in the main study.

The researcher enquired from the learners whether there were questions that were difficult to understand. The unclear and difficult questions were marked and later reworded and others rephrased. The researcher also requested the teacher of English language from the pilot school to go through the English reading comprehension passages and give feedback on whether the content and questions were understandable or not. After this, the suggestions and feedback collected during the pilot study were incorporated into the instruments during the main study.

3.1.10 Research Instruments

Language assessment in the context of language teaching and learning refers to making judgments on learner's knowledge of a language and ability to use it. It includes formal measurement tools, which yield quantifiable scores and other types of qualitative assessments. Assessments involve the process of making inferences about learners' language proficiency on the basis of 'observed performance' (Jiang, 2020).

The instruments used in the study for data collection were: one pre-test, one post-test and nine reading comprehension assessment passages. The comprehension passages content were naturally informative educative and appropriate for learners' readability level and of socio- cultural disposition.

The passages were both expository and narrative texts as required by form three English language syllabuses. Expository passages communicate, describe and explain non-fictional information. They have specific text structure, for example, sequence, compare and contrast, cause and effect, problem and solution, description, enumeration, categorization, etc. They require reader to have background knowledge of the content of the reading material (Grabe, 2002).

Narrative passages tell stories; they have a beginning, middle and an end. The reading comprehension passages used in this study had information presupposed by the background knowledge of the learners.

3.1.11 Data Collection

Data collection started with the pre-tests being administered to both groups to establish the homogeneity in reading comprehension ability before the commencement of the intervention.

This was meant to attribute any changes in reading comprehension performance during the post-test to the intervention. During the intervention period, reading comprehension assessments were administered to measure learners' performance of each reading comprehension skills. The English language teacher administered the English reading comprehension passage assessments. The instructions were spelt out after which the participants answered questions on an average time of 30 minutes. The answer sheets were collected immediately. A post-test was administered at the end of the intervention period to measure the reading comprehension performance.

3.1.12 Quantitative Data Analysis

After scoring was completed, all raw scores were keyed into SPSS (Statistical Package for the Social Sciences) version 20 to aid analysis. The first data set included all background variables including age, number of languages spoken and group type. The second data set included the pre-test scores, while the third data set included the - cumulative raw scores of the three reading comprehension skills of each phase (pre-, while- and post- reading). The fourth data set included the raw scores of each reading

comprehension skill in each phase; previewing, prediction, semantic mapping, inference, note-making, paraphrase, summary writing, questioning and discussion skill and the last was post-test scores.

The quantitative data was analyzed by descriptive and inferential statistics. Descriptive statistics was used to describe the basic features of the data in the study. Inferential statistics are procedures that permit the researcher to make tentative generalizations from sample data to the population from which the sample was drawn (Cohen et al., 2007). Inferential statistics deals with probabilities not absolute truth proof. Research results do not prove anything, they only support research hypotheses. The relevant inferential statistics were employed to test the following null hypotheses of the present study at significant *p* value of 0.05.

H01: There is no statistically significant difference between results of control and experimental group in the post-test of reading comprehension. *t- test for independent samples* were used to test this hypothesis. A t-test is a statistical technique that is used to compare whether there are statistically significant differences between the means of two groups randomly assigned, for example in a pretest and a post-test in an experiment.

H02: There is no statistically significant correlation between reading comprehension skills and reading comprehension performance. Pearson's Product Moment Correlation Coefficient was used to test this hypothesis.

The Pearson's Product Moment Correlation Coefficient is represented by the symbol *r*. The *r* measures the strength of the linear relationship between two quantitative variables. *r* is always a statistical value ranging from -1.0 to+1.0. When $r > 0$ it indicates a positive association and when $r < 0$ it indicates a negative association. Values of *r* near zero

indicate a weak linear relationship. The strength of linear relationship increases as *r* moves away from zero toward +.1.0 or -1.0. A perfect positive correlation (+1) is only found where there is a one-to-one incremental relationship between the two variables; this level of correlation (perfect correlation) is unlikely in social research (Corte, 1995).

The value of *p* for which a correlation will be considered statistically significant is called the alpha level (α) and must be reported. SPSS notation for *p* values is Sig. (2 tailed).

The correlation in the present study was aimed at determining the relationship that existed between the different reading comprehension skills, on one hand and the reading comprehension performance, on the other hand, for both the control and experimental groups.

H03: Pre-reading comprehension skills of previewing, prediction and semantic mapping have no statistically significant predictive value in determining reading comprehension performance of control and experimental groups. Multiple linear regression analysis was done to test this hypothesis.

The multiple regression equation was as follows:

$$Y = \beta o + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \varepsilon$$

Where Y = Reading comprehension performanceβo = Constant

X1 =previewing reading comprehension skillsX2 = prediction reading comprehension skills X3 = semantic mapping reading comprehension skills β1, β2, β3 and β4 = Regression Coefficients

ε = Error term

H04. While-reading comprehension skills of inference, note-making and paraphrasing have no statistically significant predictive value in determining reading comprehension

performance of control and experimental groups. Multiple linear regression analysis was done to test this hypothesis.

The multiple regression equation was as follows: Y = βo + β1 X1 + β2 X2 + β3 X3 + β4 X4 + ε Where Y = Reading comprehension performanceβo = Constant

X1 =inference reading comprehension skills

X2 = note-making reading comprehension skillsX3 = paraphrasing reading comprehension skillsβ1, β2, β3 and β4 = Regression Coefficients

ε = Error term

H_{05}: Post-reading comprehension skills of summary writing, questioning and discussion have no statistically significant predictive value in determining reading comprehension performance of control and experimental groups. Multiple linear regression analysis was done to test the above hypothesis.

The multiple regression equation was as follows:

Y = βo + β1 X1 + β2 X2 + β3 X3 + β4 X4 + ε

Where Y = Reading comprehension performanceβo = Constant

X1 =summary writing reading comprehension skillsX2 = questioning reading comprehension skills

X3 = discussion reading comprehension skillsβ1, β2, β3 and β4 = Regression Coefficients ε = Error term

Multiple regressions are used to predict and weight the relationship between two or more *explanatory* (independent variables) and an *explained* (dependent variable). In other words, it is used to calculate the effects of two or more independent variables on an independent variable. In multiple regression the adjusted SPSS output provides adjusted ***R*** square. The adjusted ***R*** squared indicates how much variance in the dependent variable

is explained by the independent variable(s).

The Beta (β) values gives an indication how many standard deviation units will be changed in the dependent variable for each standard deviation unit of change in each of the independent variables. The Beta (β) weighting of the independent variables is given in the standardized coefficients.

The F- output indicates whether the set of independent variables collectively predicted the dependent variable.

Having set the null hypotheses, I set the level of significance that was used to support or not to support the null hypothesis; this is the alpa (α) level. The above null hypotheses were tested at $\alpha = 0.05$ level of significance that is, for 95 per cent of the time the null hypothesis is not supported.

3.1.13 Qualitative Content Data Analysis

Qualitative data analysis involves organizing, accounting for and explaining the data; in short, it is making sense of data in terms of the participants' definition of the situation, noting patterns, themes and categories (Cohen et al., 2007). In qualitative research credibility, dependability and transferability are used to describe different aspects of trustworthiness.

Credibility in qualitative data analysis deals with how well categories and themes cover data, that is, no data have been unintentionally or systematically excluded or irrelevant data included. Credibility is also a question of how to evaluate the similarities and differences between categories (Graneheim & Lundman, 2004).

Transferability refers to the degree to which the results of qualitative study can be transferred to other settings or groups with other respondents, that is, interpretive

equivalent of generalizability (Anney, 2014).

Dependability refers to stability of findings on time. It involves evaluating the findings, the interpretation and recommendations of the research to make sure they are all supported by the data received from the participants of the study (Graneheim & Lundman, 2004).

This study employed content analysis as a form of qualitative data analysis. Content analysis is a strict and systematic set of procedures for rigorous analysis, examination and verification of the contents of written data. It is an approach of empirical, methodological controlled analysis of texts within their context of communication, following content analytic rules and step by step models, without rash to quantification (Graneheim & Lundman, 2004).

Graneheim and Lundman, (2004, p.49) define content analysis as

> '*a research method thatprovides a systematic and objective means to make valid inferences from verbal, visual or written data in order to describe and quantify specific phenomena'.*

According to Cohen et al., (2007) content analysis is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use. Texts are defined as any written communicative materials which are intended to be read, interpreted and understood by people other than the analysts. Content analysis involves a process designed to condense raw data into categories or themes based on valid inference and interpretations. This process uses inductive reasoning, by which themes and categories emerge from the data through the researcher's careful examination and constant comparison (Graneheim & Lundman, 2004).

The researchers in content analysis do both *manifest* and *latent* analysis. In a manifest analysis, the researcher describes what the informants actually say, stays very close to the

text, uses the words themselves and describes the visible and obvious in the text. Latent analysis is extended to an interpretive level in which the researcher seeks to find the underlying meaning of the text: *what the text is talking about* (Elo & Kyngäs, 2008). The purpose of content analysis is to organize and elicit meaning from the data collected and to draw realistic conclusions from it. In the present study the researcher sought the underlying meaning of erroneous answers obtained from reading comprehension assessment passages.

3.1.13.1 Population Sample in Content Analysis

The population here refers to the text (domain of analysis). For example, newspapers articles, interview transcripts, textbooks, conversations, examination scripts, emails, one single written question, pictures, films and so on. Content analysis can be used on all types of texts, no matter where the material comes from (Cohen et al., 2007).

The texts of analysis for this study were the written erroneous answers obtained from the reading comprehension assessment passages.

3.1.13.2 Sample Size

Samples of qualitative content analysis usually consist of purposively selected texts which can inform the research question(s) being investigated. All the textual units that contributed to answering the research question were purposively selected and made the sample for the study. Fifty erroneous answers obtained from reading comprehension assessment passages made the sample size of the qualitative content analysis of the study. Blank spaces and incomplete answers were not considered to be part of the sample.

3.1.13.3 The Context of Erroneous Answers

The context of generation of the document analysis examines, how the material was

generated; who was involved; where the document came from; how the material was recorded; the authenticity and credibility of the documents. The documents that generated the units of analysis of this study were the reading comprehension assessment passages. The assessments were intended to measure reading comprehension skills like: inference, note-making, semantic-mapping, among others.

The scoring was done as follows: every correct answer was awarded 2 marks; no mark was awarded to erroneous answer.

3.1.13.4 The Units of Analysis

The units of analysis can be at different levels, for example, a word, a phrase, sentence, paragraph, whole text and themes. Qualitative content analysis uses individual themes as units for analysis, rather than the physical linguistic units (e.g., word, sentence or paragraph). A theme is recurring regularity developed within categories or cutting across categories and is an issue of relevance to the research question(s) (Cohen et al., 2007). The units of analysis for this study were the themes that emerged.

3.1.13.5 Categories for Analysis

Categories are the main groupings of constructs or key features of the text, showing links between units of analysis. Categories are inferred by the researcher, whereas specific words or units of analysis are the raw data (Cohen et al., 2007). Categories can be derived from three sources: the data, previous related studies and theories. This study's categories were drawn from the raw data.

Qualitative content analysis allows one to assign a unit of the text to more than one category simultaneously (Duriau et al., 2007). However, identified categories and themes

should be internally homogeneous and externally heterogeneous, which means that no data should fall between two groups nor fit into more than one group (Bengtsson, 2016).

The results of qualitative content analysis can support the development of new theories and models, as well as validating existing theories and providing dense descriptions of particular settings or phenomena (Graneheim & Lundman, 2004).

3.1.14 Ethical Considerations

Any research, especially one involving human subjects is liable to forces emanating from environment. Research ethics should be considered in all five stages namely: planning stage, data gathering stage, the processing, data interpretation stage and the dissemination of the research results stage.

At the planning stage, ethical consideration demands that only participants who know why they are volunteering to participate in the research should be selected. The participants should make an informed consent. The informed consent encompasses voluntary consent, knowledgeable consent and freedom from harm. This means that the participants should know that their consent to participate in the research should be voluntary and free and not through coercion and that the consent can be withdrawn with no consequences at all. With regard to knowledgeable consent, it is imperative that the participants be made aware of any risks and or benefits that may emanate from participating in the research study. The participants should also be protected from any physical, cultural, social or even psychological harm. It is therefore the duty of the researcher to make sure that the participants in the research make an informed consent.

At the data gathering stage, ethical considerations require honesty to be maintained when observing behavior, conducting interviews or surveys. The researcher here can

demonstrate honesty by being very clear on how procedures like interviewing will be carried out. Bias on the part of the interviewer or in the wording of questions, for example, designed to produce a certain response should be avoided.

Ethics in the processing and interpretation of data requires honesty in the interpretations made from the data. Any conclusions made should emanate from the data. The data should not be used to provide credence to some pre-established conclusions. In this regard, during the data analysis, interpretation and discussion, I represented the information gathered from the field (classroom texts) accurately as received.

Finally, ethics in disseminating research results requires that three participants' ethical issues be put in mind. These are protecting the privacy of the participants, ensuring the anonymity of participants and respecting the confidentiality of participants involved in the research. Privacy means ensuring that participants' identity cannot be deciphered from the findings. Confidentiality means that no one else knows the sample member names and address apart from the primary researcher. Ethics in the dissemination of the research results also requires that researchers should not report incomplete research results; misleading reports or biased reports.

In the analysis and dissemination of results in this study, a number of measures were taken to ensure privacy, anonymity and confidentiality of the participants. First of all, the names of the schools in the sample, and the names of teachers were not used. Instead, schools were coded A-B randomly, then, the students, on the other hand, were coded as S1 to S73.

Generally, the discussion of the findings is based on the trends that emerged from the data and not from any preconceived ideas. The researcher did not know the participants

and this also helped to reduce bias.

3.2 Summary

The focus of this chapter was the research methodology adopted for the present study. The chapter has presented the sampling design and procedures used as well as the methods of data analysis and presentation. Chapter four that follows focuses on quantitative findings, interpretations and discussions in line with the study's objectives.

CHAPTER FOUR

QUANTITATIVE FINDINGS, INTERPRETATIONS AND DISCUSSIONS

4.0 Introduction

This chapter presents the quantitative findings, interpretations and discussions in line with the study's objectives. The demographic data of participants is presented first using some selected descriptive statistics. In presenting the results, each objective is given followed by specific inferential statistical analysis used to test the null hypotheses.

4.1 General and Demographic Information

This section gives the general information on the participants' age and number of languages spoken by the participants. The participants' ages ranged from 15 to 18 years as shown in table. The mean age was 17 years (SD.75). This was expected because the entry age at form one is 14 years and so many learners in form three are between 16 to 17 years.

Table 4: *2* Age Description of Participants

	N	Range	Min	Max	M	SD	Sk
Age of Student	73	3	15	18	16.51	.75	.28
Valid N (list wise)	73						

Note. Min =Minimum; Max =Maximum; *M* = Mean; *SD* = Standard Deviation;

The participants' number of languages spoken ranged from 3 to 4 languages as shown in table

3. The mean number of languages spoken was 3 languages (SD.200).

Table 4.*3:* Description number of Languages Spoken by Participants

	N	Range	Min	Max	M	SD	Sk
Number Of Languages Spoken	73	1	3	4	3.04	.200	4.721

Note. Min =Minimum; Max =Maximum; *M* = Mean; *SD* = Standard Deviation; Sk = Skewness

4.2 Tests of the Hypotheses

The first objective of this study was to establish the difference between results of control and experimental group in the post-test of reading comprehension. The following null hypothesis was advanced:

H01: There is no statistically significant difference between results of control group and experimental group in the post-test of reading comprehension performance.

Two independent sample t-tests were performed. The first t-test was to establish whether there was a significant difference in the reading comprehension performance of learners in the two groups before exposing the experimental group to reading comprehension skill activities. The findings were as shown in table 4.

Table *4.4:* Independent sample t-test for Equality of pre-tests means scores

	Group	N	Mean	Std. Deviation	Std.Error Mean
Average pre-test	Control	34	7.43	2.41	.41
	Experimental	39	8.27	2.06	.33

Note: N=Control 34, Experimental 39

Table 4 shows the number of learners in each category and the mean values, the mean score for the control group was 7.43 compared to 8.26 for the experimental group. This means that the reading comprehension performance (RCP) mean for experimental group was higher. The table also shows the standard deviation of the scores for each group. This

is the average deviation from the mean for each group of scores providing a measure of the spread of the scores from the mean. The standard deviation of the performance of the control group is slightly larger than that for the experimental group.

To find if the mean difference in reading comprehension performance was statistically significant, a Levene's test for equality of variances was done. Levene's test is an inferential statistic used to assess the equality of variances for a variable calculated for two or more groups. That is, the difference between the variances is zero. Equal variances across samples are called homogeneity of variance. Homogeneity of variance means that the group variances should be the same throughout the data (Gastwirth et al., 2009). The results of Levene's statistics are shown in table 5 below.

Table 4.5: Test of Homogeneity of Variances

Levene's statistics	F	Sig.	t	df	Sig.	Mean Difference	Std. Error Difference	95% Confidence Interval	
	1.08	.30	-1.59	71	.12	-.83	.52	-1.88	.21

Table 5 indicates that the difference in the two means is not statistically significant and a larger value (p=.12) is larger than the conventional significance level of $p<.05$. Therefore, there is no significant difference in mean scores between the two groups after the pre-test. This indicates that the group variances were equal in pre-tests and hence the assumption of homogeneity of variance was met.

Findings of Objective One

To find the difference in reading comprehension performance in post-test of the control and experimental groups, the second independent samples t- test was done and the findings are as shown in Table 6.

Table 4.*6:* Independent Samples T-Test for Equality of Post-test Mean Scores

Test for		t-test for Equality of Means								
		F	Sig.	t	dff	Sig.(2-tailed)	Mean Difference	Std. Error Difference	5% Confidence terval of the Difference	
									Lower	Upper
Post Test	Equal variances assumed	22.06	.00	-11.05	71	.00	-6.98	.632	-8.24	-5.73
				-	54.18	.00	-6.98	.603	-8.19	-5.77

Results in Table 6 shows that the difference in mean was significant *(p*<.00). This means that the observed difference in reading comprehension performance between the two groups after the post-test occurred due to reading comprehension skill activities intervention. Therefore, the null hypothesis was rejected and it was concluded that reading comprehension skill activities improved reading comprehension performance of the experimental group learners. This means that the observed difference in reading comprehension performance between the two groups after the post-test occurred due to the reading comprehension activities intervention. Based on these results, the present study concludes that:

One, reading comprehension skill activities cumulatively have the strength to improve learners' performance in reading comprehension.

Two, reading comprehension skill activities cumulatively prevent comprehension failure and support readers' interpretation of the text through interaction between the reader and the text.

Three, they activated the experimental group learners' schemata that promoted comprehension and the interpretation of the reading comprehension passages. Four, the findings imply that better understanding of reading comprehension passages is achieved by reading comprehension skill activities exposed to learners before, during and after the reading exercise.

The research suggests that better reading comprehension of secondary school learners is achieved by use of appropriate and effective reading comprehension activities during the reading lessons. Therefore, the results of this study underscore the effective use of reading comprehension skill activities in reading skill comprehension lessons.

The results of this study resonate with quasi-experimental study findings by Wang, (1989) who conducted a study among EFL learners. The learners improved in reading comprehension after being exposed to reading comprehension skill activities. The findings also corroborate with a report by Yusuf (2011) whose study included senior male and female secondary school learners.

Research in reading comprehension in L_1 and L_2 fields has shown that reading comprehension skill activities can be taught to improve reading comprehension performance (Pressley, 2002). In this regard, this study adds that reading comprehension skill activities may serve as a useful tool for reading comprehension in facilitating learners' reading comprehension ability and that age, gender, settings (ESL or EFL) are not variables that hinder reading comprehension performance. In addition, they nurture

comprehension, assist in focusing attention and connect information from the text with the learner's schemata.

Findings of Objective Two

In the second objective, the study sought to find the relationship between each reading comprehension skill activities and reading comprehension performance. To establish whether the relationship between each reading comprehension skill activities and reading comprehension performance was significant or not, the following null hypotheses were tested.

H_{02}: There is no significant relationship between each reading comprehension skill activities and reading comprehension performance for control or experimental group.

To test these hypotheses data were subjected to Pearson's Product Moment Correlation Coefficient and the results were presented as in tables 7 to 24.

Table 4.*7*: Correlation between Previewing Reading Comprehension Skills and Reading Comprehension Performance of the Control Group

		RCP	**Mean of previewing skills**
RCP	Pearson Correlation	1	.33
	Sig. (2-tailed)		.06
	N	34	34

Note: N=34, RCP-reading comprehension performance

There was a statistically non-significant, moderate, positive correlation between previewing skills and reading comprehension performance of the control group (r=.325, n=34, p=.06). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that previewing skills was not significantly related to reading comprehension performance of the control group.

Table 4.*8: Correlation between Previewing Skills and Reading Comprehension Performance of the Experimental Group*

		RCP	Mean previewing skills
RCP	Pearson Correlation	1	.35
	Sig. (2-tailed)		.03
	N	39	39

Note: N= 39, RCP-Reading comprehension performance

There was statistically significant, moderate, positive correlation between previewing skills and reading comprehension performance of the experimental group (r=.352, n=39, p=.03). The correlation results did not support the supplementary null hypothesis and therefore, it was concluded that previewing skills was significantly related to reading comprehension performance of the experimental group.

Results from tables 7 and 8 show that previewing skills were significantly related to reading comprehension performance of experimental group and they were non-significant to reading comprehension performance of the control group.

Table 4.*9: Correlation between Prediction Reading Skills and Reading Comprehension Performance of the Control Group*

		RCP	Mean of prediction skills
RCP	Pearson Correlation	1	.25
	Sig. (2-tailed)		.15
	N	34	34

N= 34, RCP- Reading comprehension performance

There was a statistically non-significant, weak, positive correlation between prediction

skills and reading comprehension performance of the control group (r=.252, n=34, p=.15). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that prediction reading skills was not significantly related to reading comprehension performance of the control group.

Table 4.10: ***Correlation between Prediction reading skills and Reading comprehension Performance of the Experimental Group***

		RCC	**Mean of prediction skills**
RCP	Pearson Correlation	1	.53
	Sig. (2-tailed)		.001
	N	39	39

N=39, RCP- Reading comprehension performance

There was a statistically significant, strong, positive correlation between prediction skills and reading comprehension performance of the experimental group (r=.531, n=39, p=.001). The correlation results did not support the supplementary null hypothesis and therefore, it was concluded that prediction skills were significantly related to reading comprehension performance of the experimental group.

Results from tables 9 and 10 show that prediction skills were significantly related to reading comprehension performance of experimental group and they were non-significant to reading comprehension performance of the control group.

Table 4.11:*Correlation between Semantic Mapping Reading Skills and Reading Comprehension Performance of the Control Group*

		RCP	**Mean of semantic mapping**
RCP	Pearson Correlation	1	.14
	Sig. (2-tailed)		.43
	N	34	34

Note: N= 34, RCP = Reading Comprehension Performance

There was a statistically non-significant, weak, positive correlate between semantic mapping skills and reading comprehension performance of the control group (r=.141, n=34, p=.43). The correlation result supported the supplementary null hypothesis and therefore, it was concluded that semantic mapping skills was not significantly related to reading comprehension performance of the control group.

Table 4.12:*Correlation between Semantic Mapping Reading Skills and Reading Comprehension Performance of the Experimental Group*

		RCP	**Mean of semantic mapping**
RCP	Pearson Correlation	1	.33
	Sig. (2-tailed)		.04
	N	39	39

Note: N=39, RCP-reading comprehension performance

There was a statistically significant, moderate, positive correlation between semantic mapping skills and reading comprehension performance of the experimental group (r=.330, n=39 p=.04). The correlation results did not support the supplementary null hypothesis and therefore, it was concluded that semantic mapping skills was significantly related to reading comprehension performance of the experimental group.

Results from tables 11 and 12 show that semantic mapping skills were significantly related to reading comprehension performance of experimental group and they were non-significant to reading comprehension performance of the control group.

Table 4.13: *Correlation between Inference Making Reading Skills and Reading Comprehension Performance of the Control Group*

		RCP	**Mean of inference skills**
RCP	Pearson Correlation	1	-.19

	Sig. (2-tailed)		.29
	N	34	34

Note: N=34, RCP- reading comprehension performance

There was statistically non-significant weak, negative correlation between inference making skills and reading comprehension performance of the control group (r=-.187, n=34.p=.29). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that inference skills were not significantly related to reading comprehension performance of the control group.

Table 4.14: ***Correlation between Inference Making Skills and Reading Comprehension Performance of the Experimental Group***

		RCP	**Mean of inference skills**
RCP	Pearson Correlation	1	.46
	Sig. (2-tailed)		.03
	N	39	39

Note: N=39, RCP- reading comprehension performance

There was a statistically significant, moderate, positive correlation between inference making skills and reading comprehension performance of experimental group (r=.457, n=39, p=.03). The correlation results did not support the supplementary null hypothesis and therefore, it was concluded that inference making skills was significantly related to reading comprehension performance of the experimental group.

Results from tables 4.13 and 4.14 show that inference making skills were significantly related to reading comprehension performance of experimental group and they were non-significant to reading comprehension performance of the control group.

Table 4.15: ***Correlation between Note-making Skills and Reading Comprehension Performance of the Control Group***

		RCP	Mean of note making skills
RCP	Pearson Correlation	1	.16
	Sig. (2-tailed)		.38
	N	34	34

Note: N= 34, RCP- reading comprehension performance

There was a statistically non- significant, weak, positive correlation between note-making skills and reading comprehension performance of the control group (r=. 156.n=34, p=.38). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that note-making skills was not significantly related to reading comprehension performance of the control group.

Table 4.16: ***Correlation between Note-making Skills and Reading Comprehension Performance of the Experimental Group***

		RCP	Mean of note making skills
RCP	Pearson Correlation	1	.15
	Sig. (2-tailed)		.35
	N	39	39

Note: N=39, RCP-reading comprehension performance

There was a statistically non-significant, weak, positive relationship between note-making skills and reading comprehension performance of the experimental group (r=.154, n=39, p=.35). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that note-making skills were not significantly related to reading comprehension performance of the experimental group. Results from tables 15 and 16 show that note-making skills were non-significant to both experimental and control group reading comprehension performance.

Table 4.17: Correlation between Paraphrasing Skills and Reading Comprehension Performance of the Control Group

		RCP	Mean of paraphrasing skills
RCP	Pearson Correlation	1	.20
	Sig. (2-tailed)		.25
	N	34	34

Note: N=34, RCP-reading comprehension performance

There was a statistically non-significant, weak, positive relationship between paraphrasing skills and reading comprehension performance of the control group (r=.204, n=34, p=.25). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that paraphrasing skills were not significantly related to reading comprehension performance of the control group.

Table 4.18:*Correlation between Paraphrasing skills and Reading Comprehension Performance of the Experimental Group*

		RCP	Mean of paraphrasing skills
RCP	Pearson Correlation	1	.24
	Sig. (2-tailed)		.14
	N	39	39

Note: N=39, RCP- reading comprehension performance

There was a statistically non- significant, weak, positive relationship between paraphrasing skills and reading comprehension performance of the experimental group (r=.239, n=39, p=.14). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that paraphrasing skills were not significantly related to reading comprehension performance of the experimental group.

Result from tables 17 and 18 show that paraphrasing skills were non-significant to both experimental and control group reading comprehension performance.

Table 4.19 ***Correlation between Summary Writing Skills and Reading Comprehension Performance of the Control Group***

		RCP	Mean summary writing skills
RCP	Pearson Correlation	1	.22
	Sig. (2-tailed)		.21
	N	34	34

Note: N=34, RCP- reading comprehension performance

There was a statistically non-significant, weak, positive relationship between summary writing skills and reading comprehension performance of the control group (r=.222, n=34, p=.21). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that summary writing skills were not significantly related to reading comprehension performance of the control group.

Table4.20: ***Correlation between Summary Writing Skills and Reading comprehension Performance of the Experimental Group***

		RCP	Mean of summary writing skills
RCP	Pearson Correlation	1	.16
	Sig. (2-tailed)		.33
	N	39	39

Note: N=39, RCP-reading comprehension performance

There was a statistically non-significant, weak, positive correlation between summary writing skills and reading comprehension performance of the experimental group (r=.159, n=39, p=.33). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that summary writing skills were not significantly related to reading comprehension performance of the experimental group.

Result from tables 19 and 20 show that summary writing skills were non-significant to both experimental and control group reading comprehension performance.

Table 4.21: ***Correlation between Question Posing Skills and Reading Comprehension Performance of the Control Group***

		RCP	Mean of questioning skills
RCP	Pearson Correlation	1	.16
	Sig. (2-tailed)		.38
	N	34	34

Note: N=34, RCP-reading comprehension performance

There was a statistically non-significant, weak, positive relationship between question posing skills and reading comprehension performance of the control group (r=.155, n=34, p=.38). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that questioning skills were not significantly related to reading comprehension performance of the control group.

Table 4.22: ***Correlation between Question Posing Skills and Reading Comprehension Performance of the Experimental Group***

		RCP	Mean of questioning skills
RCP	Pearson Correlation	1	.17
	Sig. (2-tailed)		.31
	N	39	39

Note: N=39, RCP- reading comprehension performance

There was a statistically non-significant, weak, positive relationship between question posing skills and reading comprehension performance of the experimental group (r=.166, n=39, p=.31). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that questioning skills were not significantly related to reading comprehension performance of the experimental group.

Results from tables 21 and 22 show that question posing skills were non-significant to both the experimental and the control groups' reading comprehension performance.

Table 4.23 ***Correlation between Group Discussion Skills and Reading Comprehension Performance of the Control Group***

		RCP	Mean of discussion skills
RCP	Pearson Correlation	1	.20
	Sig. (2-tailed)		.26
	N	34	34

Note: N=34, RCP- reading comprehension performance

There was a statistically non- significant, weak, positive relationship between group discussion skills and reading comprehension performance of the control group (r=.199, n=34, p=.26). The correlation results supported the supplementary null hypothesis and therefore, it was concluded that discussion skills were not significantly related to reading comprehension performance of the control group.

Table 4.24: ***Correlation between Group Discussion Skills and Reading Comprehension Performance of the Experimental Group***

		RCP	Mean of discussion skills
RCP	Pearson Correlation	1	.44
	Sig. (2-tailed)		.005
	N	39	39

Note: N=39, RCP- reading comprehension performance

There was a statistically significant, weak, positive relationship between group discussion skills and reading comprehension performance of the experimental group (r=.437, n=39, p=.005). The correlation results did not support the supplementary null hypothesis and therefore, it was concluded that discussion skills were significantly related to reading comprehension performance of the experimental group.

Results from tables 23 and 24 show that group discussion skills were significantly related to experimental group and non-significant related to control group reading comprehension performance.

When two variables are found to correlate, it means that relative positions in one variable are associated with relative positions in the other variable. It does not necessarily mean that changes in one variable are caused by changes in the other variable. The correlation results of the present study imply that there is a relationship between the reading comprehension skills and reading comprehension performance after the activation of learners' schemata.

The study's results are generally supported by the findings by Ajideh, (2003) who carried out a study among undergraduate learners, and established that reading comprehension skill activities had a strong relationship with reading comprehension performance. The results were also, in line with those reported by Gatbonton and Segalowitz, (1988) among Taiwanese college learners' reading comprehension of American short stories. The findings may further substantiate the view by Alyousef, (2006) that reading comprehension skill activities had a strong positive relationship with reading comprehension performance of intermediate English second language learners. The third objective of the study sought to establish the predictive value of the pre-reading comprehension skills related to *previewing*, *prediction* and *semantic mapping* in determining learners' reading comprehension performance for control and experimental.

To test the supplementary null hypothesis a multiple regression analysis was conducted. A multiple regression analysis determines which dependent variable best predicts or explains the dependent variable. The analysis was performed on both the control and experimental groups. The aim was to explain the relative importance of the different independent variables in explaining reading comprehension performance. To test these hypotheses the followingmodel was posited:

$RCP = \beta 0 + \beta 1SemMap\ i + \beta 2PredSkills\ i +$

$\beta 3PrevSkills\ i + Ɛi$ The coefficients in our

posited model are as follows:

RCP= Reading Comprehension Performance

β0: The intercept - the average value of RCP when semantic mapping skills, prediction skills and preview skills equal 0

β1: the slope on previewing reading skills that is, the average difference in RCP associated with a one-unit difference in previewing skills while holding prediction and semantic mapping skills constant.

β2: the slope on prediction skills that is the average difference in RCP associated with one unit difference in prediction skills while holding semantic mapping and previewing skills constant. β3: the slope on semantic mapping skills that is the average difference in RCP associated with one unit difference in semantic mapping skills while holding previewing and prediction skills constant.

εi: The error term this is an assumption that an error is normally distributed with a mean of 0 and constant variance. Each β in a multiple regression equation indicates the expected change in Y (dependent variable) associated with a unit change in the independent variable (x) under consideration while controlling for or holding constant the effects of the other independent variables. The results of running the model were as follows:

Table 4.26: Proportion of Variance of the Dependent Variable Control Group

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.66[a]	.44	.38	.28

a. Predictors: (Constant), mean of semantic mapping, mean of prediction skills, mean of previewing skills

Results in Table 26 show the proportion of variance (R^2) of the dependent variable accounted for by the independent variables. That is, R^2 indicates whether the regression of

Y on the independent variables taken together is statistically significant. Based on R^2 results pre-reading comprehension skills: *semantic mapping*, *prediction* and *previewing* account for about 44% of the variance in reading comprehension performance of the control group.

To test whether the three variables together predicted the outcome variable one way ANOVA was conducted as shown in the table 27 below.

Table 4.27: ANOVA for Significance of the Regression control group

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.80	3	.60	7.79	.001[b]
	Residual	2.31	30	.08		
	Total	4.11	33			

a. Dependent Variable: Reading comprehension performance

b. Predictors: (Constant), mean of semantic mapping, mean of prediction skills, mean of previewing skills.

Table 27 shows the analysis of variance testing the significance of the regression. An *F* statistic is a value found when ANOVA is run to find out if a group of variables are jointly significant. From *F* results, a significant regression was found ($F = 7.79$, $p < .01$). This imply that the three pre-reading predictor variables significantly predicted the reading comprehension performance of the control group.

Further analysis using multiple regressions was done to determine the significant and non- significant predictor of reading comprehension performance from the three variables. The results are presented in Table 28.

Table 4.28*: Regression Analysis of Previewing, Prediction and Semantic Mapping Skills for*

the Control Group

Model					T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.15	.36		5.10	.00	1.41	2.89
	Mean of previewing skills	.30	.09	.45	3.23	.003	.11	.48
	Mean of prediction skills	.30	.19	.29	1.59	.12	-.09	.68
	Mean of semantic mapping	.63	.21	.42	3.04	.005	.21	1.05

a. Dependent Variable: Reading comprehension performance

Table 28 reveals that *previewing* and *semantic mapping* skills had a significant predictive value for reading comprehension performance unlike *prediction* skills that did not significantly predict reading comprehension performance of the control group. From Table 28, a resultant model of prediction was identified and presented in equation 1.

Equation 1

(β= .45, t = 3.23, p<.003).

This equation shows that *previewing skills* were significant predictor of reading comprehension performance of the control group (p<.003). Thus, the results failed to support the supplementary null hypothesis. The obtained positive beta values (β=.45, p<.003) was an indication that previewing skills positively predicted reading comprehension performance. This implies that one standard deviation increases in learners' previewing skills score would lead to a 0.45 standard deviation increase in learners' reading comprehension score. This suggested that reading comprehension performance occurred when the control group learners were not exposed to *previewing* reading comprehension activities.

From Table 28, another resultant model of prediction was identified and presented in equation 2.

Equation 2

(β=.30, t=1.59, p=.12).

This equation shows that *prediction* skills were not a significant predictor of reading comprehension performance (p=.12) for the control group. Thus, the results supported the supplementary null hypothesis. The obtained beta values (β=.30, p=.12) indicated that *prediction* skills had non-significant predictive values on reading comprehension performance for the control group.

From Table 28, another resultant model of prediction was identified and presented in equation 3.

Equation 3

(β=.42, t=3.04, p<.05).

This equation shows that *semantic mapping* skills were a significant predictor of reading comprehension performance (p<.05) for the control group. Thus, the results failed to support the supplementary null hypothesis. The obtained positive beta values (β=.42, t=3.04, p<.05) was an indication that *semantic mapping* skills positively predicted reading comprehension performance. This implies that one standard deviation increases in learners' semantic mapping skills score would lead to a 0.42 standard deviation increase in learners' reading comprehension score. This suggested that increase in reading comprehension performance occurred when the control group learners were not exposed to sematic mapping reading comprehension activities. Thus, control group learners were naturally able to generate words and concepts related to the topic of the reading comprehension assessment passages. In other words, learners correctly wrote the subordinate words that clarified the main concept. They also used their existing schemata and experience to draw concepts that were associated with the topic of reading comprehension assessment passages.

Table4.29*: Proportion of Variance of the Dependent variable Experimental group*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.817[a]	.667	.638	.267

a. Predictors: (Constant), mean of semantic mapping, mean of prediction skills, mean of previewing skills.

As presented in Table 29, R^2 indicates the proportion of variance of the dependent variable accounted for by the independent variables. The test of R^2 also indicates whether the regression of *Y* on the independent variables taken together is statistically significant. Based on R^2 results the pre-reading comprehension skills of *semantic mapping, prediction* and *previewing* of the experimental group accounted for 66.7% of the variance in reading comprehension performance.

To test whether the three variables together predict the outcome variable in one way, ANOVA was conducted as shown in the table below.

Table 4.30: *ANOVA for Significance of the Regression Experimental group*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.01	3	1.67	23.34	.000[b]
	Residual	2.50	35	.072		
	Total	7.51	38			

Dependent Variable: Reading comprehension performance

Predictors: (Constant), mean of semantic mapping, mean of prediction skills, mean of previewing skills.

Table 30 shows the analysis of variance testing the significance of the regression. An *F* statistic is a value found when ANOVA is run to find out if a group of variables are jointly significant, a significant regression was found (*F* 23.34, p=.00). This implied that

the three pre-reading predictor variables: *semantic mapping, prediction* and *previewing* significantly predicted the reading comprehension performance of the experimental group

Further analysis using multiple regressions was done to determine the best predictor of reading comprehension performance from the three pre-reading variables. The results are presented in Table 31.

Table 4.31: ***Regression Analysis Previewing, Prediction and Semantic Mapping Skills for the Experimental Group***

Predictors		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.18	.34		6.45	.000	1.50	2.87
	mean of previewing skills	.44	.10	.44	4.34	.000	.23	.65
	mean of prediction skills	.54	.11	.47	4.76	.000	.31	.77
	mean of semantic mapping	.60	.12	.50	4.93	.000	.35	.84

Dependent Variable: Reading comprehension performance

Table 31 shows that, *previewing, prediction and semantic* mapping skills had significant predictive value ($p<0.05$) for reading comprehension performance of the experimental group. From Table 31, a resultant model of prediction was identified and presented in equation 4.

Equation 4

($\beta=.44$, $t=4.34$, $p<.00$).

This equation shows that *previewing* skills were a significant predictor of reading comprehension performance ($p < .00$). Thus, the results failed to support the supplementary null hypothesis. The obtained beta values indicated that *previewing* skills had high and positive significant predictive values on reading comprehension performance and that the experimental group's reading comprehension performance increased by .44 points for every standard deviation increase in *previewing* skills. These results were significant for both the control and experimental groups. The present study suggested that the results were as such because of effectiveness of textual clues like pictures, photographs, sub-titles and titles in reading comprehension passages. These textual clues naturally play a role in schema activation and thus improve the interpretation and comprehension of the reading comprehension.

A number of studies such as Carrell, 1984; Yusuf, 2011; Zhaohua, (2003) support the effectiveness of textual clues in reading comprehension passages. These studies show that textual clues contextually related to content of the passage prior to reading not only provide the reader with prior information, but also activates the readers' schemata; thus, enhancing comprehension of the passage.

The results on previewing skill activities resonate with the findings reported by Yusuf, (2011) among senior secondary schools in Nigeria. The results support those reported in the study by Magliano et al., (2011) among grade 10 learners ranging between 16 to 19 years of age that previewing skill activities had a significant value in predicting learners' reading comprehension when used at pre-reading phase.

The findings of the study contrasted with the findings of studies by Hansen, 1981; Duke & Pearson, 2004; Dole et al., 1991) in which the experimental group outperformed the control group in reading comprehension after fourth and fifth grade learners were

exposed to previewing skill activities.

From these results, the study contends that naturally textual clues like pictures, photographs and titles in reading comprehension passages play a role in schema activation and thus improve the interpretation and comprehension of the reading comprehension passage. Textual clues also help the readers to become more interested in what they read, make them to concentrate on the reading task and increase their ability to make good guesses about the reading comprehension passage. This natural process activates schemata and results in more understanding of the text.

It is important to note that textual clues naturally play a role in schema activation and thus improve the interpretation and comprehension of the reading comprehension. Therefore, it was beyond the scope of the present study to assign the increased reading comprehension performance to the exposure to previewing reading comprehension skill activities.

From Table 31, another resultant model of prediction was identified and presented in equation 5.

Equation 5

(β=.473, t=4.763, p=. 000).

This equation shows that *prediction* skills were a significant predictor of reading comprehension performance (p<=.000). Thus, the results failed to support the supplementary null hypothesis. The obtained beta values indicated that prediction skills had high and positive significant predictive values on reading comprehension and that the experimental group's reading comprehension increased by .47 points for every standard deviation increase in *prediction* skills. This means that the prediction reading

comprehension skill activities activated the experimental group learners' existing schemata appropriate knowledge structures. In other words, the experimental group learners correctly expressed what they did not know and what they knew about the topics of the reading comprehension assessment passages before reading. This offered them a chance to make similarities and differences between what they already knew and were ready to accommodate the incoming information from the reading comprehension passages in their pre-existing schemata. In addition, the reading comprehension assessment passages answered the questions that they were not sure of.

Gilakjani & Sabouri, (2016a) described prediction activities as a process in which readers make guesses about the text topic by use of their prior knowledge and experience and then read the text to confirm on these predictions.

The findings of this study regarding prediction skill activities were in agreement with a study by Yusuf, (2011) that found Nigerian secondary school learners having a better reading comprehension performance when exposed to prediction reading comprehension skill activities before reading the text.

The results also support the findings by Ness, (2011) in a study among elementary school learners that showed that prediction skill activities improve reading comprehension of the learners when they relate the text with what happened in their experiences. In addition, the findings affirm that prediction skill activities play an important role in improving reading comprehension performance. Learners with well-developed prediction skills comprehend reading comprehension passages better than those with no exposure to the activities.

This study therefore observes that exposing learners to prediction as pre-reading comprehension skill activities their schemata become redefined and extended and this improve their reading comprehension ability.

From Table 31, another resultant model of prediction was identified and presented in equation 6.

Equation 6

(β=.500, t=4.925, p<.00).

This equation shows that *semantic mapping* skills were a significant predictor of reading comprehension performance (p<.00). Thus, the results failed to support the supplementary null hypothesis. The obtained beta values (β=.50, p<.00) indicates that *semantic mapping* skills had higher and positive predictive values on reading comprehension performance and that the experimental group's reading comprehension performance increased by .50 points for every standard deviation increase in *semantic* mapping skills.

It is worth to note that both the control and experimental group learners were able to generate words and concepts related to the topic of the reading comprehension assessment passages. In other words, learners correctly wrote the subordinate words that clarified the main concept. They also used their existing schemata and experience to draw concepts that were associated with the topic of English reading comprehension assessment passages.

Studies that have examined whether semantic mapping reading comprehension activities activate learners' schemata have shown that these activities activate learners' schemata when exposed to learners at pre-, while- and post-reading phases. For example, Agustina and Nur (2018) stated that at the pre-reading phase there is *categorization* of the concept

where learners are asked to give out subordinate ideas that help explain or clarify the main concept.

In the while-reading phase learners are allowed to *personalize* the semantic map by adding or eliminating information from the semantic map. New information is then integrated with prior information and makes the learners' schemata to be more active, interactive and creative.

At the post-reading phase, *post assignment synthesis* on semantic map is done through a discussion with the learners. This makes the learners' schema undergo modification in order to accommodate the new information. New information or experience cannot be fully accommodated under an existing schema, so the schema is modified to become more consistent with the new experience.

The findings of the present study contrasted with those in the previous studies regarding the predictive value of semantic mapping skill activities on English reading comprehension performance. For example, Norris (2007) reported significant predictive value for semantic mapping skill activities on reading comprehension performance when they were implemented as a pre- reading activity for experimental group.

Thus, it was beyond the scope of the present study to assign the increased reading comprehension performance of experimental group to the exposure to sematic mapping reading comprehension skill activities.

The fourth objective of the study sought to establish the predictive value of while–reading comprehension skills including inference making, paraphrasing and note-making in determining learners' reading comprehension performance.

For the second group of independent variables the following model posited: $RCP = \beta 0 + \beta 1 InfeSkills\ i + \beta 2 Note\text{-}makSkills\ i + \beta 3 ParaSkills\ i + \varepsilon i$

The coefficients in our posited model are as follows:

RCP= Reading Comprehension Performance

$\beta 0$: The intercept- the average value of RCP when inference skills, note-making skills and paraphrasing skills equal 0

$\beta 1$: the slope on inference skill activities, that is, the average difference in RCP associated with one unit difference in inference skill activities while holding note-making and paraphrasing skill activities constant.

$\beta 2$: the slope on note-making skills activities, that is, the average difference in RCP associated with one unit difference in note-making skill activities while holding inference and paraphrasing skill activities constant.

$\beta 3$: the slope on paraphrasing skill activities, that is, the average difference in RCP associated with one unit difference in paraphrasing skills while holding inference and paraphrasing skill activities constant.

εi: The error term that is, the error is normally distributed with a mean 0 and constant variance. Each β in a multiple regression equation indicates the expected change in Y associated with a unit change in the independent variable under consideration while controlling for, or holding constant the effects of the other independent variables.

The results of running the model were as follows:

Table 4.32: ***Proportion of Variance of the Dependent Variable Control Group***

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.58[a]	.34	.27	.30

a. Predictors: (Constant), mean of paraphrasing skills, mean of inference skills, mean of note making skills

As presented in Table 32, R^2 indicates the proportion of variance of the dependent variable accounted for by the independent variables it also indicates whether the regression of *Y* on the independent variables taken together is statistically significant. Based on R^2 results, *inference, and note-making* and *paraphrasing* reading comprehension skills account for about 33% of the variance in reading comprehension performance.

To test whether the three variables together predicted the outcome variable one way, ANOVA was conducted as shown in the table below.

Table4.33: ***ANOVA for Significance of the Regression Control group***

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	1.38	3	.46	5.06	.06[b]
	Residual	2.73	30	.09		
	Total	4.11	33			

a. Dependent Variable: Reading comprehension performance

b Predictors: (Constant), mean of paraphrasing, mean of inference, mean of note- making skills. Table 33 shows the analysis of variance, testing the significance of the regression. An *F* statistic is a value found when ANOVA is run to find out if a group of variables are jointly significant, a non-significant regression was found (F=5.063, p=.06). This implied that the three while- reading predictor variables did not predict the reading comprehension performance of the control group.

Further analysis using multiple regressions was done to determine the best while-reading skill predictor of reading comprehension performance of the control group. The results are presented in Table 34.

Table 4:34: ***Regression Analysis of Inference, Note-Making and Paraphrasing Skill Activities for the Control Group***

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.50	.38		6.68	.000	1.74	3.27
	mean of inference skills	.13	.15	.14	.86	.40	-.17	.43
	mean of note making skills	.39	.14	.44	2.69	.01	.09	.68
	mean of paraphrasing skills	.48	.15	.49	3.22	.003	.178	.79

a. Dependent Variable: Reading comprehension performance

Table 34 reveals that *note-making* and *paraphrasing* reading comprehension skill had a significant predictive value for reading comprehension performance unlike inference skills that did not significantly predict reading comprehension performance of the control group.

From Table 34, a resultant model of prediction was identified and presented in equation 7.

Equation 7

(β= .14, t = .86, p<.40).

This equation shows that *inference making* skills was not a significant predictor of reading comprehension performance (p<.40) for the control group. Thus, the results supported the supplementary null hypothesis. The obtained beta values indicated that *inference making skills* had high and positive non-significant predictive values on reading comprehension of the control group reading comprehension.

From Table 34, another resultant model of prediction was identified and presented in equation 8.

Equation 8

(β= .39, t = .2.90, *p*<.01).

This equation shows that *note-making* skills were a significant predictor of reading comprehension performance (p<.01) for the control group. Thus, the results did not support the supplementary null hypothesis. The obtained beta values indicated that *note-making* skills had high and positive significant predictive values on reading comprehension performance and that control group reading comprehension increased by 0.39 points for every standard deviation increase in *note-making* skills. This implies that one standard deviation in learners' previewing score would lead to .39 standard deviation increase in learners 'reading comprehension score. From Table 34, a third resultant model of prediction was identified and presented in equation 9.

Equation 9

(β= .483, t = .3.224, *p*<.03).

This equation shows that *paraphrasing* skill activities were a significant predictor of reading comprehension performance (p<.03) for the control group. Thus, the results did not support the supplementary null hypothesis. The obtained beta values indicates that *paraphrasing* skills had high and positive significant predictive values on reading comprehension performance and that control group reading comprehension increased by .48 points for every standard deviation increase in *paraphrasing* skills.

The same analysis was carried out for the experimental group with the same model posited and the results were as follows.

Table4.35: ***Proportion of Variance of the Dependent variable Experimental group***

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.72[a]	.51	.47	.32

a. Predictors: (Constant), mean of paraphrasing, mean of note-making, mean of inferenceTable35, R^2 indicates the proportion of variance of the dependent variable accounted for by the independent variables. The test of R^2 indicates whether the regression of *Y* on the independent variables taken together were statistically significant. Based on R^2 *inference, note- making* and *paraphrasing* skills account for about 51% of the variance in reading comprehension performance for the experimental group.

To test whether the three variables together predict the outcome variable one way, ANOVA was conducted as shown in the table 36.

Table 4.36: ***ANOVA for Significance of the Regression Experimental group***

Sum of Squares			Df	Mean Square	F	Sig.
1	Regression	3.86	3	1.29	12.30	.000[b]
	Residual	3.66	35	.10		
	Total	7.51	38			

a. Dependent Variable: Reading comprehension performance.

b. Predictors: (Constant), mean of paraphrasing, mean of note-making, mean of inference Table 36 shows the analysis of variance testing the significance of the regression. An *F* statistics a value found when ANOVA is run to find out if a group of variables are jointly significant, a significant regression was found (F=12.30, p<.00). This implied that the three while-reading predictor variables predicted the reading comprehension performance of the experimental group.

Further analysis using multiple regressions was done to determine the best predictor of reading comprehension performance from the three of while-reading variables. The

results are presented in Table 4.37.

Table 4.37: ***Regression Analysis Inference, Note-making and Paraphrasing Skill Activities for the Experimental Group***

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.00	.49		4.11	.000	1.01	2.99
	mean of inference skills	.75	.17	.54	4.42	.000	.41	1.09
	mean of note-making skills	.45	.15	.37	3.06	.004	.15	.75
	mean of paraphrasing skills	.62	.14	.56	4.51	.000	.34	.90

a. Dependent Variable: Reading comprehension performance

As shown in Table 37 *inference*, *note-making* and *paraphrasing* skills had a significant predictive value for reading comprehension performance of the experimental group ($p<.05$). From Table 37, a resultant model of prediction was identified and presented in equation 9.

Equation 10

($\beta=.75$, $t=4.1$, $p=.00$).

This equation shows that *inference making* skills were a significant predictor of reading comprehension performance ($p= .00$). Thus, the results failed to support the supplementary null hypothesis. The obtained beta values indicates that inference skills had high and positive significant predictive values on reading comprehension performance and that the experimental group reading comprehension increased by .75 points for every standard deviation increase in inference skills. In other words, inference making skill activities

contributed to better performance in reading comprehension. The positive outcome of the inference making reading comprehension skills intervention of the present study supported the idea, that, inference making activities activate learners' schemata spontaneously when they are needed for knowledge-demanding inferences. Compared with other researches, this study's results were no different with regard to inference making investigation only. They differ in terms of the participants, the text types and the research design.

Studies by Hansen & Pearson, (1983); Dole et al., (1991) indicated that learners find answering inferential making questions more difficult than literal comprehension questions. Konza (2011) associated contextual inference making with thoughtful readers, who are able to use what they know, put together the clues from the text and think ahead to draw conclusions.

The results of this study are in line with those of recent studies by Elbro & Buch-Iversen, (2013); Kern (2014) observing that inference making activities improves reading comprehension performance of 16 sixth-grade learners.

The present study therefore, adds that inference making reading comprehension skill activities evolve learners' existing schemata in order to accommodate implied information in the reading comprehension passage. In other words, implied information or experience in the reading comprehension passage cannot be fully accommodated under an existing schema, so the schema evolves to become more consistent with implied information.

This study is of the view that learners infer when they merge what they know with clues in the text to draw conclusion. When readers do not infer they will not grasp the deeper

crux of the texts they read. This process should be automatic, effortless and seamless. When it is not, readers will struggle to comprehend what they have read (Perfetti, 2003). Thus, this process was automatic, effortless and seamless to experimental group readers of the present study hence the good inference making skill performance.

From Table 4.37, another resultant model of prediction was identified and presented in equation 9.

Equation 11

(β=.49, t=3.2, p<. 03).

This equation shows that *note-making* skills were a significant predictor of reading comprehension performance (p< .03). Thus, the results failed to support the supplementary null hypothesis. The obtained beta values indicated that *note-making* skills had high and positive significant predictive values on reading comprehension performance and that the experimental group's reading comprehension increased by 0.45 points for every standard deviation increase in *note-making* skills.

These results were significant for both the control and experimental groups. This implies that, learners were able to engage with ideas in the reading comprehension passages and transformed the original text into their own words. From these findings, it can be concluded that note-making reading comprehension skill activities as while-reading skill activities cannot be assigned to activate the schemata of the learners.

This study's findings contrasted with findings of other studies like Khanam et al., (2014) which showed that learners' comprehension improves when they are exposed to note-making skill activities as while-reading activities in both ESL and EFL settings, and when learners are of different education levels and ages.

From Table 41, a resultant model of prediction was identified and presented in equation 11.

Equation 11

(β=.69, *t*=4.5, *p*<. 004).

This equation shows that *paraphrasing* skills were a significant predictor of reading comprehension performance (*p*< .04). Thus, the results failed to support the supplementary null hypothesis. The obtained beta values indicates that *paraphrasing* skills had high and positive predictive values on reading comprehension performance and that the experimental group's reading comprehension increased by 0.69 points for every standard deviation increase in *paraphrasing* skills. These results were significant for both control and experimental group. This means that, the learners had enough vocabularies that made them to come out with different ways of paraphrasing sentences correctly and retained sentence original meaning as it was in the reading comprehension assessment passages. They also had the ability to generate literal representation of a sentence by substituting many words and phrases in it. Limited vocabularies hinder learners from writing sentences in their own words without changing the meaning (Kletzien, 2009).

The findings of the present study contrasted with those in the previous study by Kletzien, 2009; Khanam et al., (2014) who found out that the experimental group performed better in reading comprehension after being exposed to paraphrasing reading comprehension skill activities in comparison to the control group. They also contrasted with Gersten et al., (2010) study where learners in the experimental group outperformed the control group learners on the paraphrasing skill. The findings of the present study also contrasted with the findings reported by Hua et al., (2017) where post-secondary learners in the

experimental group outperformed the control group learners in paraphrasing skills.

The fifth objective of the study sought to establish the predictive value of summary writing, questioning and discussion skills in determining learners' reading comprehension performance. For the third group of independent variables the following model was posited: $RCP = \beta 0 + \beta 1 SumWritSkills\ i + \beta 2 QuestSkills\ i + \beta 3 DiscSkills\ i + \varepsilon i$

The coefficients in posited model are as follows:

RCP= Reading Comprehension Performance

$\beta 0$: The intercept- the average value of RCP when summary writing skills, questioning skills and discussion skills equals 0

$\beta 1$: the slope on summary writing skills is the average difference in RCP associated with a one—unit difference in summary writing while holding question posing and discussion skills constant.

$\beta 2$: the slope on questioning skills is the average difference in RCP associated with a one-unit difference in question posing skills while holding summary writing and discussion skills constant.

$\beta 3$: the slope on discussion skills is the average difference in RCP associated with a one-unit difference in discussion skills while holding summary writing skills and questioning skills constant.

εi: Assumed error which is normally distributed with a mean 0 and constant variance. Each βin a multiple regression equation indicates the expected change in Y associated with a unit change in the independent variable under consideration while controlling for, or holding constant the effects of the other independent variables.

The results of running the model were as follows:

Table 4.38*: Proportion of Variance of the Dependent variable Control Group*

Model	R	R Square	Adjusted R Square	Error of the Estimate
1	.66[a]	.44	.39	.28

a. Predictors: (Constant), mean of discussion skills, mean of summary writing skills, mean of questioning skills.

From the above table, R^2 indicates the proportion of variance of the dependent variable accounted for by the independent variables. The test of R^2 indicates whether the regression of *Y* on the independent variables taken together is statistically significant. Based on $R,^2$ *summary writing*, *question posing* and *discussion* skills account for 44% of the variance in reading comprehension performance of the control group.

To test whether the three variables together predicted the outcome variable one way, ANOVA was conducted as shown in the table below.

Table 4.39*: ANOVA for Significance of the Regression Control* Group

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.81	3	.60	7.87	.001[b]
	Residual	2.30	30	.08		
	Total	4.12	33			

a. Dependent Variable: Reading comprehension performance

b. b. Predictors: (Constant), mean of discussion, mean of summary writing, mean of questioning skills

Table 39 above shows the analysis of variance testing the significance of the regression an F=7.873, p<.01. This implies that the three post-reading predictor variables significantly predicted the reading comprehension performance of the control group.

Further analysis using multiple regressions was done to determine the significant and non- significant predictor of reading comprehension performance from the three variables

of post- reading phase. The results are presented in table below.

Table4.40; ***Regression Analysis of Summary writing, Questioning and Discussion Skills for the Control Group***

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**sig**	**95.0% Confidence Interval for B**	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.51	.26		9.71	.000	1.98	3.04
	mean of summary writing skills	.50	.13	.53	3.81	.001	.23	.77
	mean of questioning skills	.30	.12	.34	2.45	.021	.05	.55
	mean of discussion skills	.22	.13	.23	1.66	.107	-.05	.49

Dependent Variable: Reading comprehension performance

As shown in Table 40 *summary writing* and *question posing* skills had a significant predictive value ($p<.00$) for reading comprehension but *discussion* skills had no significant predictive values ($p=.10$) for the control group.

From Table 4.40, a resultant model of prediction was identified and presented in equation 12.

Equation 12

($\beta= .50$, $t = 3.81$, $p<.01$).

This equation shows that *summary writing* skills were a significant predictor of reading comprehension performance ($p<.01$) for the control group. Thus, the results did not support the supplementary null hypothesis. The obtained beta values indicated that *summary writing* skills had high and positive predictive values on reading comprehension

performance and that control group reading comprehension performance increased by 0.50 points for every standard deviation increase in summary writing skills.

From Table 40, another resultant model of prediction was identified and presented in equation 13.

Equation 13

(β= .30, t = 2.41, *p*<.012).

This equation shows that *question posing* skills were a significant predictor of reading comprehension performance (p<.01) for the control group. Thus, the results did not support the supplementary null hypothesis. The obtained beta values indicated that questioning skills had high and positive predictive values on reading comprehension performance and that control group reading comprehension increased by 0.30 points for every standard deviation increase in question posing skills.

From Table 40, a third resultant model of prediction was identified and presented in equation 14.

Equation 14

(β= .22, t = 1.66, *p*<.11).

This equation shows that *discussion* skills were not a significant predictor of reading comprehension performance (p<.11) for the control group. Thus, the results supported the supplementary null hypothesis 5.3. The obtained beta values indicated that the control group's reading comprehension increased by 0.22 points for every standard deviation increase in discussion skills.

The same analysis was carried out for the experimental group with the same model posited and the results were as follows.

Table 4.41: ***Proportion of Variance of the Dependent variable Experimental group***

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.69[a]	.48	.43	.34

a. Predictors: (Constant), mean of discussion skills, mean o summary writing skills, mean of questioning skills

From the above table, R^2 indicates the proportion of variance of the dependent variable accounted for by the independent variables. The test of R^2 indicates whether the regression of *Y* on the independent variables taken together is statistically significant. Based on R^2, summary writing, questioning and discussion skills account for about 48% of the variance in reading comprehension performance of the experimental group.

To test whether the three variables together predict the outcome variable one way, ANOVA was conducted as shown in the table below.

Table 4.42: ***ANOVA for Significance of the Regression Experimental Group***

Model	Sum of Squares		Df	Mean Square	F	Sig.
1	Regression	3.57	3	1.19	10.57	.000[b]
	Residual	3.94	35	.113		
	Total	7.51	38			

a. Dependent Variable: Reading comprehension performance

b. Predictors: (Constant), mean of: discussion, summary writing, questioning skills

Table 42 shows the analysis of variance testing the significance of the regression. An *F* statistic is a value found when ANOVA is run to find out if a group of variables are jointly significant, a significant regression was found (F= F=10.57, p<.00). This implied that the three post-reading predictor variables predicted the reading comprehension performance of the experimental group.

Further analysis using multiple regressions was done to determine the best predictor of

reading comprehension performance from the three variables of post-reading phase. The results are presented in Table 4.43.

Table 4.43: Regression Analysis of Summary writing, question posing and Discussion Skills for the Experimental Group

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.03	.53		3.82	.001	.95	3.11
	mean of summary writing skills	.63	.16	.56	4.10	.000	.32	.95
	mean of questioning skills	.71	.21	.46	3.33	.002	.28	1.14
	mean of discussion skills	.49	.14	.44	3.44	.002	.20	.78

a. Dependent Variable: Reading comprehension performance

As presented in Table 43 summary writing, question posing and discussion skills had a significant predictive value ($p<0.05$) of the reading comprehension performance for experimental group.

From Table 47, a resultant model of prediction was identified and presented in equation 15.

Equation 15

($\beta=.63$, $t=4.10$, $p<.00$).

This equation shows that *summary writing* skills were a significant predictor of reading comprehension performance ($p< .00$). Thus, the results failed to support the supplementary null pothesis. The obtained beta values indicate that *summary writing*

skills had high and positive predictive values on reading comprehension and that the experimental group's reading comprehension increased by .63 points for every standard deviation increase in *summary writing* skills.

These results were significant for both experimental and control group. This means that, the learners were able to identify the main ideas, generalize and remove unnecessary words, phrases and sentences when tested for summary writing skills. In other words, learners could extrapolate information at more abstract level that improved their comprehension. In addition, they were able to list ideas of the reading comprehension passages into phrases, turned phrases into sentences that they then combined into paragraphs by use of transitional words.

The findings of the present study are in contrasted with other studies by Pardo (2004) and Konza (2011) who found that teaching how to summarize for a longer period helped learners to summarize main ideas, especially those that are explicitly stated in the text.

For summary writing reading comprehension activities to be a significant predictor of reading comprehension performance, might be the time factor as Soleimani and Esmaeili, (2014, p.53) argued:

The teaching of summary writing comprehension skill activities will involve a considerable investment of time and effort in order to be effective on reading comprehension. Therefore, we need long-time studies to examine the effect of summary writing. Otherwise, teaching might not obtain the intended results as expected.

It is from this argument that this study points to the need for more time in exposing learners to summary writing skill activities to find out whether predicting reading comprehension performance from summary writing will yield different results.

From Table 43, another resultant model of prediction was identified and presented in equation 16.

Equation 16

(β=.71, t=3.33, p<. 02).

This equation shows that *question posing* skills were a significant predictor of reading comprehension performance (p< .02). Thus, the results failed to support the supplementary null hypothesis. The obtained beta values indicated that *questioning* skills had high and positive predictive values on the reading comprehension and that the experimental group's reading comprehension increased by .71 points for every standard deviation increase in questioning skills. These results were significant for both the control and experimental groups learners.

The findings of this study contrasted with the findings of a study by Soleimani & and Esmaeili, (2014) who found that the experimental group participants significantly improved their reading comprehension scores over time, from pre-test to post-test after intervention of questioning reading comprehension activities.

From Table 43, a third resultant model of prediction was identified and presented in equation 17.

Equation 17

(β=.41, t=3.44, p<. 002).

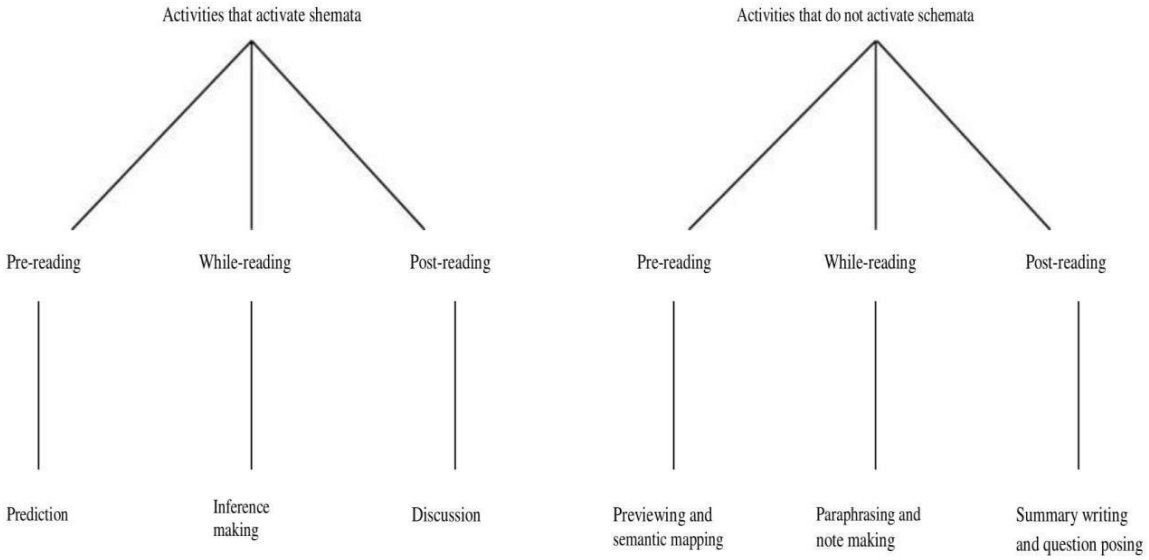
This equation shows that *discussion* skills were a significant predictor of reading comprehension performance (p<.02). Therefore, the results did not support the supplementary null hypothesis. The obtained beta values indicated that *discussion* skills

had high and positive predictive values on reading comprehension performance and that experimental group reading comprehension increased by .41 points for every standard deviation increase in *discussion* skills. These results mean that discussion skill activities benefit discussants more than non- discussants because they solidify and enlarge discussants' schemata. That is, discussion skill activities create opportunities for discussants to reflect on the reading comprehension, draw attention to important ideas and assist them to understand hard concepts in a manner which other activities do not offer. In addition, the activities assist to arouse and maintain the discussants' attention to follow the story line of the reading comprehension passages.

The findings of this study support those of Stahl, (2008) which showed that reading comprehension of grade twelve increased when they were exposed to discussion skill activities during the reading comprehension lessons.

The findings are also in agreement with those of Flowers (2010) who found discussion skill activities as aiding comprehension and increasing vocabulary acquisition. In this regard, this study's findings showed that performance in reading comprehension of learners exposed to discussion activities was significantly higher than those in conventional reading comprehension lessons.

Summary of the multiple regression results are shown by the model figure 4 that follows.



Multiple-regression Analysis Results on Reading Comprehension Skills Activities

***Figure* 4: Summary of the Multiple Regression Results**

This chapter has presented the statistical analysis of quantitative findings, interpretations and discussion of the findings showing which of the reading comprehension skills were significant and which were not.

CHAPTER FIVE

QUALITATIVE RESULTS AND ANALYSIS

5.1 Introduction

The qualitative content analysis in this study was used to examine the meaning of erroneous answers obtained from reading comprehension assessment passages. The following meanings were deduced from the erroneous answers.

> *'Illogical answers,' 'blank spaces,' 'use of inappropriate words,' 'misspelling of words,' 'failure to understand the question,' 'poor grammatical constructions,' 'omission of words,' insertion of unnecessary words,' 'inability to explain the meaning of expressions and words as used in the reading comprehension assessment passages'* as well as *'incomplete answers.'*

The meanings were then drawn into type, categories and themes as shown in figures 5 and 6. The findings were discussed according to the emerging themes.

Spelling Erroneous Answers, Categories and Themes

Target word	Erroneous answer	Category	Themes
Succeed Surprise Schools Victims	Suceed Suprise Shools Vitims	Omission of consonant errors	Orthographic errors
Different Encourage Learners Maize Beauty	Diffrent Encourge Lerners Maze Beaty	Omission of vowel errors	
Disapoint Business	Dissapoint Businness	Insertion of consonant errors	
Receive Belief	Recieve Beleif	Transposition errors	
Write Hole Scene	Right Whole Sin	Words that sound alike but spelt differently (Homophonic errors)	Phonological errors
Doors Problem	Ndoors Promblem	First language induced errors	
Height	Haight	Diphthong realization	
It's Mary's	Its Marys	Poor use of apostrophe	Morphological errors

***Figure 5*: Content Analysis of Spelling erroneous answers, categories and theme**

5.2 Orthographic Errors

5.2.1 Omission of Vowel and Diphthong Errors

Omission of vowel and diphthong errors can be seen in the following examples, *diffrent

*encourge, *lerners, *maze and*beaty. The schwa sound (ə) in the word

'different' [ˈdɪf(ə)r(ə)nt] is not written when it occurred after the voiceless

labiodental fricative /**f**/ sound.

In the word 'encourage,' [ɪnˈkʌrɪdʒ] the near-close front unrounded vowel [ ] is

omitted. In the word 'learner,' [ˈlɜː(r)nə(r)] the open-mid-central unrounded vowel [ ] is

omitted while in‘maze’ /meɪz/ the near-close front unrounded vowel [ ] is left out. Apart from the short vowels and the long vowels, English language also has diphthongs. Diphthongs are instances where there is a glide from one vowel sound into another. The diphthong [juː] is omitted in the word beauty [bjuːti]. The cause of vowels and diphthong omission by L1 learner is the distinction and discrepancy found between English pronunciations and its orthography (Kelman & Apel, 2016).

5.2.3 Insertion of Consonants

Insertion of consonants can be seen in the following words: *dissapont and *businness. This is a case of use of double letters instead of single letters. According to Liu, (2015) this is another spelling problem in the English language where there is an intrusion of sound yet there is no spelling to indicate that sound. The words could be pronounced but the spelling is problematic to second language learners of English. In addition, in English, double consonants can occur in the middle of a word after a short vowel or at the end of a word. However, English language second learners might write the double consonants when there is no doubling. This type of an error illustrates the lack of integration of phonological knowledge with the orthographical knowledge in English language that results to a spelling error.

5.2.4 Transposition Errors

Transposition errors can be seen in words like *recieive and *beleif. The English language has many combinations of letters. For example, *ei* or *ie*. This can be difficult for English second language learners because these combinations may be pronounced differently in various words, while in some words, they are not pronounced all together. This is a clear indication of incompetence to recognize

English words that have multiple consistency between sound and letters (Al-oudat, 2017).

5.2.5 Homophonic Errors

Homophonic errors can be seen in words like *hole /whole, write/right* and *sin/scene.* The English spelling system is basically alphabetic: the letter or grapheme *b,* for example corresponds to the sound or phoneme /*b*/. However, the spelling of many words cannot be predicted entirely on the basis of such grapheme-phoneme correspondences. Several credible sound-based spellings may exist (*site,cite,sight*) ,or a letter sequence may not fully reflect a sound sequence

(*yatcht,laugh*) .In these cases,the correct spelling of words must simply be memorized(Kemp, 2009).

5.2.6 First Language Induced Errors

This error can be seen in the example **ndoor*. This is pre-nasalization of a plosive sound. This means that the writer of this word's first language segment /d/ is preceded by the nasal alveolar /n/ and that is why the English word *door* /dɔː/ was written as /ndɔː/. In addition, the word*problem* was written as **Promblem,* a pre-nasalization of a nasal plosive/b/. This indicates that the writer's L1 conforms to the pronunciation (words are written the way they are pronounced). This presents a challenge when L1 speakers learn English, because English is non-phonetic and spelling (orthography) violates pronunciation (Manuel, 2017).

The phonological erroneous answers indicate that learners of this study have delayed in acquiring the letter sound correspondences necessary for writing in an alphabetic language. In addition, it can be observed that respondents' letter knowledge could

not be transferred to sound knowledge. Such respondents lacked letter-sound knowledge which is very vital in performance of phonological awareness.

5.3 Morphological Errors

5.3.1 Errors in the Use of the Apostrophe

In English, the apostrophe represents a spelling distinction on morphological basis. This symbol distinguishes words that are pronounced identically as in the possessive (e.g., the family's car), the plural (e.g., the families' car), and some contractions (e.g., the family's leaving). Apostrophe use in English can therefore, contribute to an exceptionally strong test of morphological understanding for English second language learners (Kemp, 2009). Although there are many ways in which learners can understand morphology, the ability to use morphology to understand unknown words is the most promising for improving reading comprehension.

5.4 Discussion

Spelling errors in the English language can be attributed to the deep orthography of English which in turn presents an extensive challenge to L2 learners. This is because English has a high degree of irregularity. For instance, many English letters can correspond to more than one sounds. Letter *c* for example can correspond to sound /k/ as in *car* and also the sound /s/ as in *certain.* In addition, many sounds can be represented by one letter in English language. For example, the sound /k/ can be represented by *c,k or q.* In addition English has a number of consonant diagraphs (combination of consonants that are pronounced as a single sound unit) such as, *th, sh,ch* and *ck,* in which two graphemes are used to represent a single sound. These one-to-many and many-to-one relationships between graphemes and sounds in the

orthography of English make spelling of words difficult especially for learners whose first language has a shallower orthography (Miller, 2019).

As the written language exposure increases and decoding competence improves, the number and clarity of mental graphemic representations (MRGs) advances in memory and spelling becomes more fluent and automatic (Apel et al., 2004). When orthographic, phonemic and morphological knowledge are insufficient, learners may need to rely on clear MRGS to spell the words accurately.

Research has found that L2 learners use the orthographic processing strategies of their L1 when writing in an L2 (Albesher, 2018). To attain spelling of words in a shallow orthography is easier than in a deep orthography because it only requires the learning of basic phoneme-grapheme conversion rules in order to attain reading comprehension proficiency. In contrast, the learners of deep orthography need not only to memorize which grapheme corresponds with which phoneme but also learn to memorize larger units like rhymes or even whole words (Liu, 2015). That means that spelling acquisition becomes an almost life-long effort for English second language learners (ESLL) due to the deep and complex nature of the English language orthography (Kusuran, 2016).

This study's respondents were from a peri-urban area where Swahili is the *lingua franca*. Swahili language has swallow orthography where every letter in a word is pronounced and letter or letter combinations correspond to only one Swahili sound (Ngugi & Wagacha, 2005). In contrast, the orthography of English is extremely irregular and inconsistent in the relationship between letters and sounds, with many examples of a single letter representing multiple sounds, single sounds being mapped

onto multiple letters and combinations of letters representing single sounds (Norris, 2014).

According to Lexical quality hypothesis (LQH) proposed by Perfetti, (2007) emphasizes the *precision* of the lexical knowledge. Precision is recognized with the content of lexical knowledge: the specificity and completeness of the orthographic, phonological, grammatical and semantic constituents of lexical representation.

5.4 Results and Analysis of Vocabulary Knowledge Erroneous Answers

The vocabulary knowledge erroneous answers were drawn into type, categories and themes as shown in figure 6 below.

Vocabulary Knowledge Erroneous Answers, Categories and Themes

Type of erroneous answer	Target answer	Category/ condensed meaning unit	Themes
Haunting- gathering food (***Hunting***)	Haunting-anxiety, fear	An associate having sound resemblance to a stimulus word	Inadequate Phonological vocabulary knowledge
Least of tools the farmer used	***List*** of tools the farmer used		
Their was hunger	***There*** was hunger		
They ***sweet*** a lot	They ***sweat*** a lot		
The school ***stuff*** members	The school ***staff*** members		
Prefer single schools ***for*** mixed schools	***Prefer*** is used with proposition ***to***	Grammartical incorrect expressions because co-occurence of expressions is violated	Poor Collocational vocabulary knowledge
Deficiency rain	Deficiency cannot be used as ***predicative adjective*** of noun rain		
Neither the teachers ***or*** the students	***Neither*** is always followed by ***nor***		
Luke warm- way of doing something	Uninterested cool, mild	Poor construction of meaning	Inadequate semantics knowledge
Ease- doing something faster	Simple calm, relax		

***Figure 6*: Content Analysis vocabulary knowledge erroneous answers and themes**

5.3.1 Inadequate Phonological Vocabulary Knowledge Errors

Erroneous answers from the inadequacy of phonological vocabulary knowledge can be seen in the following examples: *haut vs hunt, stuff vs staff, list vs least, there vs their.* These errors mean that this study's learners experience a number of phonological processing interrelated inabilities including the inability to recognize and use the sound constituents of oral language, the inability to convert the visual print into its corresponding spoken form, inability to locate and retrieve word meaning in the mental lexicon and the use of sound codes for temporary memory storage.

According to Teng, (2016) phonological processing calls for a number of interrelated abilities, including: a) ability to recognize and use the sound constituents of oral language b) phonological decoding (the ability to convert the visual print into its corresponding spoken form) c) phonological recoding (locating and retrieving word meaning in the mental lexicon through the use of phonological information) and d) phonological memory (the use of sound codes for temporary memory storage).

The learners of this study lacked the ability to locate and retrieve word meaning in their mental lexicon through the use of word phonological information**.** Learners who manifest deficits in phonological awareness have been found to experience persistent difficulties in the word decoding (Blachman,1991). The awareness that words can be divided into single phonemes is necessary to comprehend the alphabetic principle underlying the written language system (Bryne, 1998).

5.4.1 Collocational Vocabulary Knowledge Errors

Erroneous answers from poor collocation of vocabulary knowledge can be seen in:

prefer single schools ***for*** mixed schools. Here, the verb *prefer* does not *collocate* with the preposition *for*. The other is, ***neither*** the teachers ***or*** students, where error occurs because ***neither*** is not paired with ***or***. Finally, there is *defiency* rain. Rain cannot be described as deficient.

The collocational nature of the word is a dimension of vocabulary knowledge that originates from a widespread view that language learners struggle with formulaic language in general and particularly in collocations. Collocations are viewed as a problem even for advanced learners of English language (Kemp, 2009).

5.4.2 Semantic Vocabulary Knowledge Errors

Erroneous answers from poor semantic meanings in figure 6 include lukewarm which was defined as ***way of doing something*** and ease defined as ***doing something faster.*** Lexical quality hypothesis proposes the specificity and completeness of the orthographic, phonological, grammatical and semantic constituents of lexical representations and correlations between different constituents of lexical representations. Strong connections allow printed word forms to trigger synchronous, coherent activation of all components of the word's identity required for comprehension (Perfetti, 2007). This study has established that the learners had poor and less developed lexical representations.

The knowledge of a word involves the combination of several different types of knowledge. In his clear and concise volume Stahl (1999) suggested that knowing a word means not only knowing its literal definition but also knowing its relationship to other words, its connotations in different contexts, and its power of transformation in various forms. In support of this Cunningham and Stanovich, (1999) described a

strong correlation between learners' volume of reading comprehension and their vocabulary knowledge.

5.5 Summary of the Chapter

The present chapter presented data and discussion on the natures of omission of vowel and diphthong errors, insertion of consonants, transposition errors, homophonic errors and first language induced errors.

The next chapter gives the summary, conclusion and recommendations of the present study.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study focused on an examination of reading comprehension activities and meaning of erroneous answers as determinants of reading comprehension performance among form three learners in Isinya Sub-County in Kajiado County, Kenya. Six broad objectives were examined. First, the study sought to establish the difference between results of control and experimental group in the post-test of reading comprehension.

Secondly, to find out the correlation between the reading comprehension skills activities and reading comprehension performance.

Thirdly, to establish the extent to which previewing, prediction and semantic mapping as pre-reading comprehension skill activities predict reading comprehension performance.

Fourth, to establish the extent to which inference making, note-making and paraphrasing as while-reading comprehension skill activities predict reading comprehension performance. Fifth, to establish the extent to which summary writing, question posing and discussion skills as post-reading comprehension skill activities predict reading comprehension performance.

Finally, to identify and examine the meanings of erroneous answers obtained from reading comprehension assessment passages after reading comprehension skill activities intervention. This chapter summarizes the findings of the study; outlines the general conclusions arrived at provides recommendations and gives areas for further research.

6.2 Summary of Findings

6.2.1 The difference between results of control and experimental group in the post-test of reading comprehension

The first objective of the study was to establish the difference between results of control and experimental group in the post-test of reading comprehension. It was found that there was statistically significant difference, in mean score of post-tests reading comprehension performance (t=11.05, df =71, p<.00) between the control group and experimental group. This means that the observed difference in reading comprehension performance between the two groups after the post-test, occurred due to the reading comprehension activities intervention. This implies that, one, reading comprehension skill activities have the strength to improve learners' performance in reading comprehension. Two, they prevent comprehension failure and support readers' interpretation of the text through interaction between the reader and the text. Three, they activated learners' schemata that promoted comprehension and the interpretation of the reading comprehension passages. Four, better understanding of reading comprehension passages is achieved by reading comprehension skill activities exposed to learners before, during and after the reading exercise.

6.2.2 The Correlation between the Reading Comprehension Skill Activities and Reading Comprehension Performance

After establishing that reading comprehension activities activate learners' schemata, the study then sought to establish the correlation between the reading comprehension skills activities and reading comprehension performance. Statistically significant

correlation was found between previewing (r=.352, p=.03), prediction (r=.531, , p=.001), semantic mapping (r=.330,n=39 p=.04), inference making (r=.457, p=.03) and discussions (r=.437, p=.005) skills and the reading comprehension performance of the experimental group learners. This means that; one, the experimental group learners performed better in these skills in comparison to the control group. Two, relative positions in one variable are associated with relative positions in the other variable in other words, changes in one variable are not caused by changes in the other variable. The results imply that there is a relationship between the skills and reading comprehension performance after the activation of learners' schemata.

6.2.3 Multiple Regression Analysis Results

The study went one step further to examine whether reading comprehension skills measured significantly for reading comprehension performance of the experimental group.

6.2. 4 Reading Comprehension Skill Activities that Activate the Learners' Schemata

Prediction (p=. 000), inference making (*p*=.00) and discussions (p<. 002) reading comprehension skill activities significantly predicted the experimental group learners' reading comprehension performance and they were non-significant for control group learners (prediction (*p*=.12), inference making *p*<.40), discussion (*p*<.11). This implies that one, the prediction reading comprehension skill activities activated the experimental group learners' existing schemata appropriate knowledge structures. Two, experimental group learners correctly expressed what they did not know and what they knew about the topics of the reading comprehension assessment

passages before reading. Three, learners made similarities and differences between what they already knew, accommodated the incoming information from the reading comprehension passages in their pre-existing schemata. Finally, the reading comprehension assessment passages answered the questions that they were not sure of.

In addition, inference making activities activate learners' schemata spontaneously when they are needed for knowledge-demanding inferences and the discussion skill activities created opportunities for discussants to reflect on the reading comprehension, draw attention to important ideas and assist them to understand difficult concepts of the reading comprehension passages.

6.2.5 Reading Comprehension Erroneous Answers

The sixth objective of the study was to identify and examine the meanings of erroneous answers obtained from reading comprehension assessment passages after reading comprehension skill activities intervention.

6.2.5.1 Spelling Errors

The study found spelling errors of omission of vowel and diphthong errors, insertion of consonants, transposition errors, first language induced errors and errors in the use of the apostrophe. The sources of spelling errors were: (i) learners' inability to recognize and map spelling patterns to corresponding sound patterns. (ii) inadequate repeated exposure to words;

(iii) deep and complex nature of the English language orthography; and (iv) learners had poor quality representations of words that is, they failed to draw simultaneously upon their understanding of their form and meaning. In other words, learners had

little morphological, syntactic and semantic information about words in their mental lexicon.

6.2.5.2 Vocabulary Knowledge Errors

The study found the following vocabulary knowledge errors: phonological, collocational and semantic vocabulary knowledge errors. According to lexical quality hypothesis strong connections of the orthographic, phonological, grammatical and semantic constituents of lexical representations should actuate all components of the word's identity requirements (Perfetti, 2007). This means that the learners of this study had poor and less developed lexical representations.

6.3 Conclusions

i. Reading comprehension is often discussed in terms of being a process involving the integration of decoding ability, vocabulary knowledge, prior knowledge of the topic considered, and relevant activities to make sense of a text and understand it.

ii. This study is an addition to the continuing discourse to the many reading comprehension researches in that the schema theory provides an accessible and intuitively reasonable explanation for the role of conceptual knowledge in reading comprehension. The theory assumes that readers have stored in their minds generalized networks of information that reflect common events, scenarios, objects or locations. When a reading comprehension skill activity activates a concept, this activation also triggers schemas that assist in interpreting the concept or situation and generate mental representation of the text. Schemas are commonly interpreted as having a relatively stable structure when activated and having a number of default slots to be filled in as needed by the current cycle of activation. The theory explains the knowledge readers store and recall from long term

memory for current explanation.

iii. Reading comprehension skill activities of prediction at pre-reading phase, inference making at while-reading phase and discussion at post-reading phase serve as useful tool for reading comprehension skill in facilitating learners' reading comprehension ability. In addition, they nurture comprehension, assist in focusing attention and connect information from the text with the learner's schemata.

iv. Reading comprehension is a process of interaction between the reader's background knowledge and the presupposed knowledge in the reading text. Schema theory which emphasizes the importance of background knowledge in the process of reading comprehension provides a theoretical foundation for it. Based on this, the present study designs a teaching mode of English comprehension reading lesson which is a framework of prediction at pre- reading phase, inference making at while-reading phase and discussion at post-reading phase. The new approach based on schema theory is more effective than the conventional approach (the traditional way) in improving learners' reading comprehension ability. The present study shows that schema theory facilitates reading comprehension and thus can be applied to practical teaching.

v. The results of this study provide some empirical support from Kenya with regard to the fact that reading comprehension skill activities such as prediction, inference making and discussions can boost learners' interest and help them to construct mental models (schemata) for the reading comprehension text. However, for successful reading comprehension ability learners should be proficient in their lower-level word recognition processes of phonological, orthographical, morphological spelling knowledge and vocabulary knowledge of phonological, collocational and semantic.

vi.

vii. The prominent feature of this study is that while most studies on reading comprehension reading skill activities measure the success of ESL/EFL solely by either qualitative or quantitative explanations this study has combined statistical findings with the quantitative examination of how reading comprehension skill activities predict ESL reading comprehension performance and qualitative explanations of meaning of erroneous answers obtained from reading comprehension assessment passages.

viii. A section of pre-, while-and post-reading skill activities should be provided for, alongside each reading comprehension task. This will help make reading comprehension lessons more purposeful and meaningful. This will gradually help learners build knowledge necessary for dealing with content and the structure of the reading comprehension text.

ix. English text book writers will in turn, ensure that they include pre-reading, while- reading and post- reading comprehension skill activities before every reading comprehension passage. This approach aims to increase the level of reading comprehension reasonably and effectively at secondary level.

x. The findings presented in this study have implications for the teaching of lower–level word recognition processes. In case learners at emergent schooling are conscious to phonological, orthographical, morphological spelling patterns and vocabulary knowledge of phonological, collocational and semantic. Then, it would seem easy to mark the difficulties at that stage. The lower-level word recognition processes errors made by form three learners in the present study may stem from literary negligence that emerge from frequent use of informal communication. However, future intervention would do well to focus on the phonological, orthographical, morphological spelling knowledge and vocabulary knowledge of phonological, collocational and semantic

conventions that govern the word knowledge of so many English words.

xi. The schema theory view emphasizes the role of higher -level conceptual and background knowledge as sources to reading comprehension while bottom-up and top- down theoretical views contribute to lower- level sub-components of reading comprehension.

6.4 Recommendations

Need to examine the interaction between bottom-up word recognition processes and top- down processes requiring the use of word knowledge and other linguistic skills in relation to the development of reading comprehension.

There is need for early assessment and intervention to identify learners' inadequacy in lower-level word recognition processes of phonological cognizance referred as phonological awareness; orthographic knowledge and vocabulary knowledge. This assessment would be prior to the higher-level reader-based knowledge sources of text integration processes, concerned with assimilation of text-based information and reader's schemata for the purpose of general comprehension and mental representation of the text.

Curriculum developers need to find out how well the English syllabus is being implemented especially with regard to whether teachers do actually deliberately teach and assess the reading comprehension skills as they ought to or it has already suffered the backwash effects of examination.

6.5 Further Research

The present study used reading comprehension assessments to examine the correlation, predicative value of reading comprehension activities with reading comprehension performance and meaning of erroneous answers. Further research should be done to examine the same phenomenon using different tools such as think-aloud protocols, scaffolding and reciprocal teaching.

There is need to find out at what phases of pre-reading, while-reading or post reading. Reading comprehension activities of previewing, semantic mapping, paraphrasing, note-making, summary writing and question posing are most effective. An investigation to a number of factors that are involved in L_2 read comprehension, such as first language transfer, learners' level of L_2 proficiency and previous literacy experience.

In order to achieve more reliable results in future experimental studies, researchers may make an observation of the learners' learning behavior during the reading comprehension lessons in order to find their attitude towards reading comprehension lessons and teachers' feedback.

There is also need to find out which level of reading comprehension processes make significant contribution to the prediction of reading comprehension performance. Is it the lower-level word recognition or the higher-level reading comprehension processes?

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APPENDICES

APPENDIX I: READING COMPREHENSION I

Read the passage below and then answer the questions that follow.

Studies have established that birth order personality traits can be observed in children from as early as toddler years. The traits are to a large extent, most common among clusters of first, middle and last-born children. First born are perceived as the pace setters for their siblings. In an attempt to create the best environment for their children, many parents unintentionally, experiment with the first born by setting high expectations and monitoring them closely. Owing to the fact that young children have a strong desire to please adults, and especially their parents, many passionately seek adult approval. These expectations and demand often act as motivation towards success. Studies have found that many first-born children perform well at school and often succeed in life. In addition, most first born children, who are put in charge of their siblings become reliable determine and abide by the rules. Due to the challenges, they face, as they help their parents, many acquire fine problem -solving skills. The position also makes them become strong willed and capable of taking control even in adulthood. Because the younger siblings look up to them, first born children often develop a sense of leadership and willingly take on leadership roles in broader situations. The demands, however, may have negative effects. Some first born children are likely to become perfectionists, self-critical and anxious: these traits could interfere with performance and also pose health problems. Seek the approval of others; they try their best to please their demanding parents and as they grow, they continuously seek external endorsement. Lack ability to deal with criticism: In their bid to please parents, they fear failure and criticism, which, for them, Implies incompetence.

Compete for attention: before other siblings come, they enjoy having the main focus of their parent's attention. The birth of the second child, who requires more care and attention, abruptly, ejects them from that position. Many become so traumatized that they spend the rest of their lives trying to regain their parents' undivided attention.

Unlike the first-born, the middle child does not get the chance to be an only child. And the birth of yet another, sibling takes away her or his position as a baby. The child becomes unsettled and has to learn how to cope with older and younger siblings. Studies show that their experiences help them become independent, adaptable, good negotiators, and easy to deal with. Most middle children are flexible and diplomatic. They are good at initiating friendships and enjoy sharing. On the other hand, the first born is given all the privileges and the baby gets all the attention, the middle born may feel left out .in an attempt to call for attention, some become problem children and may indulge in unhealthy competition to undo the others. Parents should help them realize their skills and talents and share out responsibilities to ensure that the middle child does not feel abandoned. The last child depends on the parents as well as the older siblings. Being the baby, this child is overly showered with love and attention. In fact, most of them are provided with whatever they demand. By the child the last child arrives, many parents have realized that it is not always possible to dictate what a child can be. As a result, family rules, boundaries and expectations are somewhat relaxed. Many last children grow to be uncultured, dependent and self-centered. they remain immature and are not likely to take on responsibilities. Such children encounter social problems as they interact with peers. Parents should avoid treating the last child like an egg in order to help him or her become mature.as soon as they acquire the physical ability to perform, they should be assigned household chores and duties.

Questions

1. Why and how do many parents experiment with their first borns'?(2mks)

2. According to the passage, what are the two major disadvantages graced by the middle child and what is the direct consequence of these?

3. "They fear failure and criticism, which for the implies incompetence"

Rewrite the statement to begin with: Failure and criticism……

4. (a) In a paragraph of about 40 words, summarise the successes or strength of the first born. (4mks)

(b)Outline the characteristics exhibited by the lastborn children. (3mks)

5. Why according to the passage is the last child referred to as "baby"?

Identify a word used in the passage to mean children who become before the last-born (2mks)

6. What do understand by the following words and phrases as used in the passage? (4mks)

a) Personality

b) Perfectionists

c) Problem children

d) Treat like an egg

APPENDIX II: READING COMPREHENSION II

Read the passage below and then answer the questions that follow.

Most of the 10 million Kenyans threatened with starvation are not where you thought they would be. They are not in the drought stricken- areas. They are, instead, in the country‘s urban centers, huddled in the informal settlements famously known as slums. A new official report lays bare the reasons for Kenya’s hunger and they go well beyond rain failure. Drought is the only one of a growing number of causes of the hunger threatening nearly 10 million people in the country.

The Kenya Food Security Update released early this week says that the highest numbers of people who are likely to starve are low- income earners who live in urban informal settlements. According to the February 2009 survey, nearly 4.1 million people in Nairobi and Mombasa are threatened with starvation because of the reduced earnings resulting from the loss of employment after the elections violence.

Matters have been made a lot worse by rising food prices. In the slums, 37percent or nearly four in every in every 10 of the households reported having only one meal a day. And adults are required to be of good behavior by restricting the food the food portions they consume. People are running into debts, moving elsewhere or selling whatever belongings they have to survive, according to the survey.

Ironically, this population is receiving the least help from the government, aid workers and Good Samaritans who are lining up to give donations everywhere. “The unfortunate reality is that intervening organizations tend to respond to emergencies fairly quickly and have less enthusiasm for funding and implementing non-food interventions that are, at the minimum, mitigative in nature,” says the report .it is jointly published by the government, the world food program. The United States agency for international development and famine early warnings

systems network.

As the global economic crisis bites and its effects are felt at home, it is unlikely that the rains- in whatever quantity will alleviate the suffering of the urban hungry. The army of the manual workers, domestic and office support staff, security guards and idlers is hungry.

If they are not fed and urgently, too Kenya's urban middle class can expect a spike in larceny and other petty crimes, all to their detriment. Not to forget the public face of the famine, those affected by the extended drought season are only 2.5 million and they have among their number some 850,000 school age children.

Another 1.9 million people are faced with starvation because they are affected by HIV and Aids either directly or they have lost a bread winner to the condition. A shocking admission in the report is that there are 150000 people displace after elections that are in transit camps close to their homes but cannot return of farm. This number receives food rations from the UN World Food Program's Emergency Operation. Officially, the government claims that it has moved 255,000 people out of the camps for the displaced. With 150,000 depending on donor dole, the resettlement effort has only benefitted 105,000 people.

The number constitutes 16 percent of the revised total of 663,000 displace people, which is the official figure from the ministry of the special programmes.

Obviously, truth is something that makes the coalition Government extremely uncomfortable that it spends most of the time sugarcoating it.

Where are most Kenyans assumed to be? 2mks

……

a) Write three words associated with starvation3mks

……

b) From your experience describe a person who is starved3mks

……

c) Which areas in Kenya are associated with starvation?

2mks

……

d) Rewrite the following sentence beginning:1mks Rising

…….....

"Matters have been made a lot worse by rising food prices"

……

e) Make notes on the reasons for the Kenyan's hunger.

3mks

……

f) What steps are the victims hunger taking for their survival?

4mks

……

g) What are the likely consequences of hunger on Kenyan's urban middle class?

2mks

…….

h) What according to the passage is wrong with the approach taken by the groups assisting the hungry? 2mks

……

i) Why is the rains unlikely to alleviate the suffering of the urban hungry?

2mks

j) Explain the meaning of the following expressions as used in the passage.

6mks

- Drought-stricken

  ……

- Informal settlements

  ……

- Sugarcoating

APPENDIX III READING COMPREHENSION

STUDENTS SMELLY FEET

Few smells are as offensive as foot odour, but not to everybody-at least not to mosquitoes! “They love it. This explains why most Anopheles mosquitoes tend to bite the lower leg,” says Prof Ahmed Hassanali, an expert in insect communication at the International Centre of Insect Physiology and Ecology (ICIPE). The new findings expected to generate interesting debate among scientists are significant and could lead to development of a bait for mosquitoes similar to that used to catch tsetse flies. Apart from using foot odour as a signal for short range host location, the mosquito makes sure it feeds from as far from the hand as possible otherwise it would be swatted before it has finished taking its meal. In addition to these mosquitoes have adapted to feeding at night when humans are least active. Professor Hassanali’s research aims at identifying chemicals from humans that make them attractive to mosquitoes. His research has shown that while some human beings may be repellent to mosquitoes, there are others with individual variations in the level of attractiveness. The most attractive are eight times as potent as the least attractive. However, says the researcher, “no human foot has been found to be repellent to mosquitoes.” Prof Hassanali says that apart from foot odour, there are other chemicals that are emitted by the human body that are potent mosquito attractants. This he says includes carbon dioxide, which we breathe out. “Human breath also contains other molecules that attract mosquitoes. In total, the human body emits about 400-500 molecules of odour,” says the Professor. Without the benefit of a nose and other senses that human beings have such as touching, insects have feelers which they use to smell and locate hosts for feeding. The feelers tend to be more sophisticated in the female mosquitoes

since they feed on blood. The males which feed on plant sugars have less sophisticated antennae. The Professor says that his research and research of other groups studying mosquito behavior have narrowed down to active chemicals from human odours to between 40–50 which he says is still a wide range. “Recently we used an advanced technique known as electro–antennography to narrow down the active chemical even further,” says the research. The mosquito antenna is a million times more sensitive than the human nose when it comes to distinguishing various odours. The technique involves attracting the antennae to an electric apparatus that creates an electric signal whenever an attractive odour is passed through the antenna. By using electro–antennography, the odours range has been narrowed down to a group of eleven chemical, some of which have never been identified as mosquito attractants before. “I can now say with confidence that we are getting there as far as mosquito attractants are concerned and we are excited by the results of our research,” says Hassanali. Once all chemicals have been identified, they 148 can be used to attract mosquitoes to artificial baits laced with chemicals from where they can be killed. Another approach that Professor Hassanali and his group of researchers are working on is the use of plant chemicals to repel mosquitoes. Plants have over the years evolved mechanisms to ward off insects that feed on them. While these may not have been directed against the mosquitoes in particular, they include a whole array of chemicals, some of which are effective in keeping mosquitoes at bay. Traditional methods have been used to identify such plants. Some communities hung some plants around their beds and use them to ward off mosquitoes. Ethnobotanical methods have been used to identify such plants. In addition to ethnobotany, researchers are using a branch of science known as chemotaxonomy to identify these repellent plants. “When we identify a plant that is repellent we screen closely related species to find out

whether they also have the properties," he says. Using these approaches several plants have been found to be potent mosquito repellents. These plants can be used easily in the rural communities as supplements to insecticide treated nets in malaria control. Professor Hassanali singles out the simplicity and cheapness of these methods as what makes them attractive. "Compared to other mosquito control methods, ours are simple and easily adaptable to rural communities." ……

APPENDIX IV READING COMPREHENSION

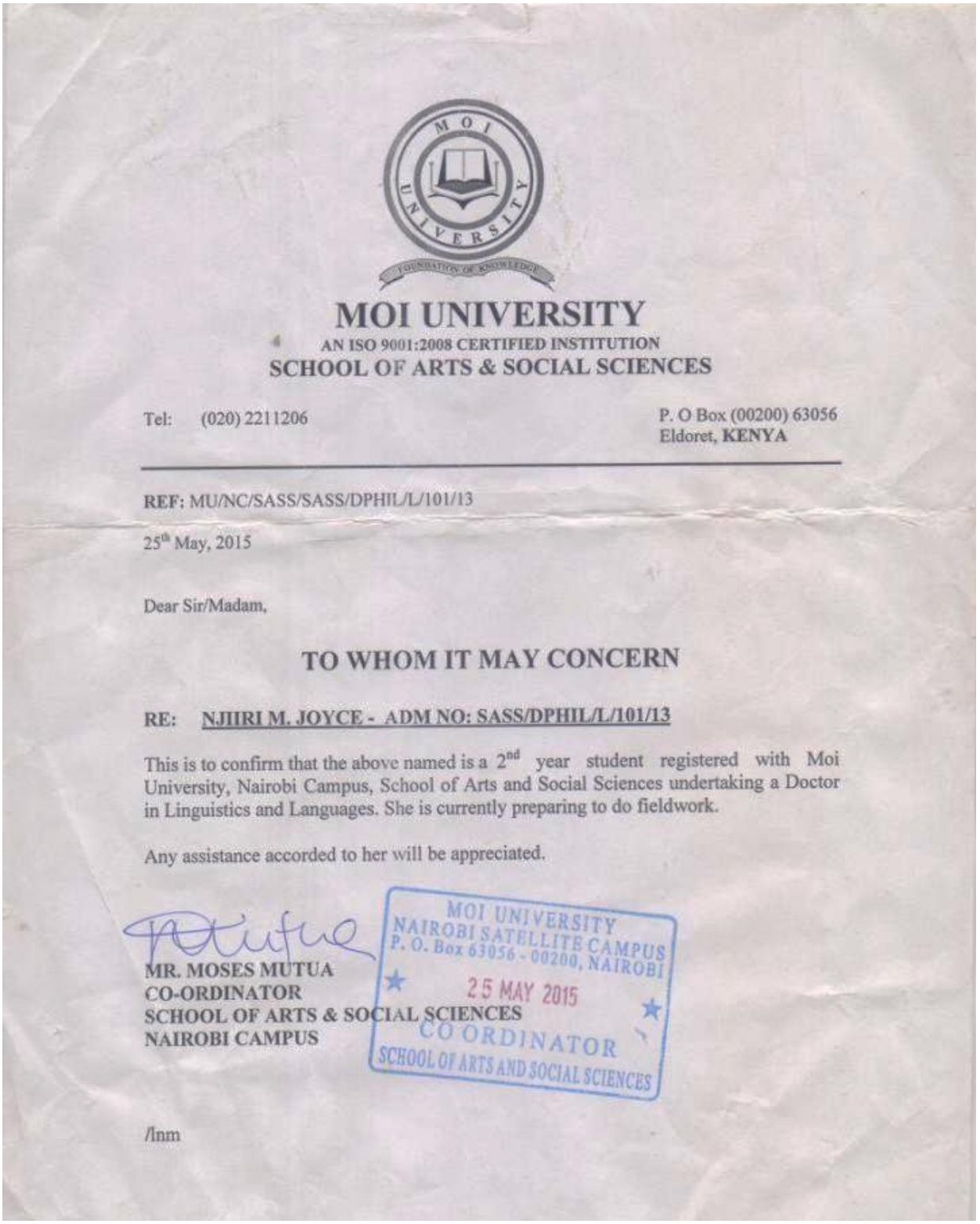
Read the following passage carefully and answer the comprehension questions that follow. Have you ever wondered why some people wake up in the morning and before they can even take a cup of tea, go out to the newspaper vendor and buy a newspaper? I used to wonder about this until I got into the habit of reading newspapers. That is when I realized that they are very rich sources of information. For example, when free education was announced in the country, everyone wanted to get all the information about it. They relied on newspapers to give them the information they needed. The story made headlines and the lead story was all about the children going to school and how the schools were coping. In newspapers, the main story usually on the first page is called the lead story. This story is usually the one that would be of interest to many readers. Many people will want to look at the headlines before deciding whether to buy the newspaper or not. Newspaper owners and editors therefore try to make the headlines as catchy as possible. There is also a page that is set aside for letters from readers. One can find very interesting letters to the newspaper editor, complaining about something bad that happened to them or congratulating someone on a job well done. 173 Then there are the humour pages and leisure pages. These are the pages where you can find jokes, puzzles and facts with fun. The jokes make you laugh and the puzzles are a good way to use your leisure time. The facts-with-fun column is very informative. For example, one newspaper reported that sparrows can stay up in the air without landing for a full year. Not many people would know that fact. Newspapers also carry advertisements. These may be for anything under the sun. They may be for jobs, services or property to let or property for sale. In most cases, advertising is done on very small spaces. The bigger the advertisement, the more money one has to pay for it. This means that the

advertisers would have to choose the words and pictures they want to appear in an advert very carefully. They must catch the readers‟ attention. This explains why most adverts are brief and to the point. Cartoons are another good method that newspapers use to make people laugh at their or other people's foolishness or thoughtlessness. For example, someone once said something really silly. A cartoonist drew a cartoon showing a tongue that was long and winding. Many people found that very funny and laughed about it. Most newspapers also carry a page that has both the picture and name of a dead person. One may sometimes see a friend or a relative who has passed away. 174 Pictures are an important feature in newspapers. Most stories are illustrated with pictures or colourful photographs that make newspapers very attractive to look at. The front page in most papers will normally carry a very attractive colour picture of a story. The children's age is very interesting. There are many interesting stories, cartoons, jokes and the crossword puzzles which make children eager to buy and read newspapers.

APPENDIX III: RESEARCH AUTHORIZATION

LETTER FROM THE

UNIVERSITY



MOI UNIVERSITY

AN ISO 9001:2008 CERTIFIED INSTITUTION

SCHOOL OF ARTS & SOCIAL SCIENCES

Tel: (020) 2211206

P. O Box (00200) 63056
Eldoret, **KENYA**

REF: MU/NC/SASS/SASS/DPHIL/L/101/13

25th May, 2015

Dear Sir/Madam,

TO WHOM IT MAY CONCERN

RE: NJIIRI M. JOYCE - ADM NO: SASS/DPHIL/L/101/13

This is to confirm that the above named is a 2nd year student registered with Moi University, Nairobi Campus, School of Arts and Social Sciences undertaking a Doctor in Linguistics and Languages. She is currently preparing to do fieldwork.

Any assistance accorded to her will be appreciated.

MR. MOSES MUTUA
CO-ORDINATOR
SCHOOL OF ARTS & SOCIAL SCIENCES
NAIROBI CAMPUS

MOI UNIVERSITY
NAIROBI SATELLITE CAMPUS
P. O. Box 63056 - 00200, NAIROBI
25 MAY 2015
CO ORDINATOR
SCHOOL OF ARTS AND SOCIAL SCIENCES

/lnm

APPENDIX IV: RESEARCH AUTHORIZATION LETTER FROM NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI, KENYA

Ref. No. **NACOSTI/P/16/78988/10391**

Date: **18th April, 2016**

Joyce Muthoni Njiiri
Moi University
P.O Box 3900-30100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"An intervention study of reading skills activities on comprehension performance in Kenya secondary schools,"*** I am pleased to inform you that you have been authorized to undertake research in **Kajiado County** for the period ending **15th April, 2017.**

You are advised to report to **the County Commissioner and the County Director of Education, Kajiado County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Kajiado County.

The County Director of Education
Kajiado County.

APPENDIX V: RESEARCH PERMIT FROM NACOSTI

THIS IS TO CERTIFY THAT:
MS. JOYCE MUTHONI NJIIRI
of MOI UNIVERSITY, 27254-100
Nairobi,has been permitted to conduct
research in *Kajiado County*

on the topic: *AN INTERVENTION STUDY OF READING SKILLS ACTIVITIES ON COMPREHENSION PERFORMANCE IN KENYA SECONDARY SCHOOLS.*

for the period ending:
15th April,2017

Permit No : NACOSTI/P/16/78988/10391
Date Of Issue : 18th April,2016
Fee Recieved :Ksh 2000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation