

**CHALLENGES TO EFFECTIVE LEARNING OF ENGLISH
BRAILLE FOR PUPILS WITH VISUAL IMPAIRMENTS IN
INTEGRATED PRIMARY SCHOOLS IN
BOMET DISTRICT IN KENYA**

BY

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DECLARATION

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

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DEDICATION

To my late mother Anne Chepkwony, wife Beatrice Kimeto , my daughter Becky Cheptoo and my son Kipchirchir to whom I owe my interest and love for my nature.
To visually impaired children who will be the beneficiaries of my study so as to compete with the sighted peers in education and other professions.

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In my numerous attempts to complete my thesis, on challenges to effective learning of English Braille, for pupils with visual impairments in Integrated Primary Schools in Bomet District in Kenya, I encountered some challenges. However, through generous collaboration with several persons, I came this far despite my visual impairment.

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ABBREVIATIONS AND ACRONYMS

AV	:	Average
APH	:	American Printing House
CBM	:	Christofel Blinden Mission
CBO	:	Community Based Organization
CIT	:	Coordinating Itinerant Teacher
EARC	:	Education Assessment Resource Centre
EFA	:	Education For All
EO	:	Education Officer
FPE	:	Free Primary Education
GoK	:	Government of Kenya
IEP	:	Individualise Education Programme
ILO	:	International Labour Organization
KCPE	:	Kenya Certificate of Primary Education
KCSE	:	Kenya Certificate of Secondary Education
KIE	:	Kenya Institute of Education
KIEP	:	Kenya Integrated Education Programme
KISE	:	Kenya Institute of Special Education
KSB	:	Kenya Society for the Blind
KU	:	Kenyatta University
LV	:	Low Vision
MDG	:	Millennium Development Goals
MU	:	Maseno University

NGO	:	Non-governmental Organization
RNIB	:	Royal National Institute for the Blind
SNE	:	Special Needs Education
SSI	:	Sight Savers International
UDPK	:	United Disabled Persons of Kenya
UN	:	United Nations
UPE	:	Universal Primary Education
VI	:	Visual Impairment/Visually Impaired
WEF	:	World Education Forum
WHO	:	World Health Organization

ABSTRACT

Learning to read and write poses more challenges to a pupil who is learning Braille than it does to those learning print. The main objective of this study was to investigate challenges to effective learning to read and write English Braille for students with visual impairment in the integrated primary schools of Bomet District in Kenya. The researcher employed a descriptive research design, using numbers to characterize individuals or a group. That was an initial investigation, in challenges to effective learning of English Braille in Bomet District and would therefore assess the nature of existing conditions in this area. The population of interest was all pupils in Bomet District with visual impairment who used Braille for reading and writing. The sample was randomly selected from the pupils in standard three to standard eight in integrated primary schools where visual impaired pupils learn alongside their sighted peers. The data collected were analyzed quantitatively and qualitatively using statistical tables, graphs, pie charts and diagrams to illustrate the results. Finally, the data were analyzed and interpreted using the statistical package for social sciences (SPSS), with conclusions and recommendations drawn from the results. From the results of the study it was established that performance in braille was low for learners with visual impairment. Several measures were recommended which when implemented will alleviate the situation and enhance reading efficiency.

CHAPTER ONE

INTRODUCTION

In this chapter, the following topics were discussed: background to the study, statement of the problem, purpose of the study, research questions, significance of the study, limitation and delimitation of the study, assumptions of the study, theoretical framework and operational definitions of terms.

1.1 Background to the study

According to World Health Organization (WHO) report on the magnitude and causes of visual impairment of 2002, more than 161 million people were visually impaired of whom 124 were people with low vision (LV) and 37 million were blind. (WHO-2002). Unless major initiatives were taken, that figure could double by the year 2020. That implied that the number of individuals who needed to read and write Braille would continue to escalate globally. That calls for the need to provide adequate learning resources for effective reading and writing of Braille.

In Kenya, there were no reliable data on the situation of persons with disabilities. Some statistics were available, although it was generally agreed that those did not give an accurate picture of the actual prevalence of disabilities. According to the National Population Census of 1999, there was an estimate of 0.7 percent of the total population (estimated at 28.61 million) were disabled. That would appear to be an underestimation.

Individuals with visual impairment were a heterogeneous social group who used different media to read and write. An educational definition of blindness implies that a pupil must use Braille or aural method in order to receive instructions. While low vision indicates that some functional vision exists to be used for gaining information through print written means with or without optical, non-optical or electronic devices (Smith et al 2001). Just like everyone else pupils with visual impairment need to be able to obtain information in an effective and timely way, exchange information with others accurately and to a desired end that was to read and write with fluency. But when one cannot use print with ease to perform the activities, alternatives need to be found. Braille along with other options such as tapes, personal readers and computer equipped with adaptive equipment present an effective alternative. Their use enables persons who are blind or visually impaired to be a fully literate participant in today's information driven society (Wormsley and D' Andrea, 1997).

According to the Ministry of Education in Kenya, records of (2003) there were three thousand one hundred and thirty four (3 134) pupils with visual impairment placed in special schools, integrated programmes and special units. The government of Kenya has taken several measures to enhance the effectiveness of special education in the country. For instance, many education commissions formed after independence provided some directions on special education. According to Silsil (2008), The Ominde Commission of 1964, recommended learners with mild disabilities to continue in regular schools. The Gachathi Commission of (1976) emphasized on improving education and other relevant services for persons with disabilities both in the schools and in the community. The Mackay Commission of (1981) recommended

a change in the education system and teaching methods, which disadvantaged pupils with VI because science was made compulsory. The Kamunge Commission (of 1988) recommended the provision of necessary facilities and equipments for learners with VI. The Koech report (1999) recommended an “Inclusive accommodative, qualitative and life-long education” (Silsil 2008:152). Although this report was not fully implemented, the few piecemeal reforms being witnessed are as a result of that report. For instance, many integrated schools were set up in regular schools to allow learners with VI to learn alongside their sighted peers. Kilimani Primary School in Nairobi, Kenya, was considered as a successful integrated school, which was funded by Sight Saver International (SSI). According to Cullen (2006) the school has a population of 1,200 pupils and 32 were visually impaired.

Apart from the educational commissions on education of learners with special needs in education, the government of Kenya was a signatory to international convention on special education. Following JOMTIEN declaration of 1990, (World Education Forum 1990) the Ministry of Education in Kenya was committed to attain universal primary education (UPE) by the year 2005 and education for all (EFA) by the year 2015. To achieve that, the Kenya government implemented free primary education (FPE) which resulted in an increased enrolment of children from 5.9 million in 2002 to 7.6 million in 2007, (Silsil, 2008 : 153).

The Dakar Declaration (2000) World Education Forum recommended facilitating working towards specific education for all by 2015. The United Nations (UN) Millenium Development Goals (MDGs) strive towards achieving universal primary

education (UPE) by ensuring that all learners regardless of their abilities complete a full course of primary schooling by 2015.

The status of special education was further strengthened in 1984 when the government of Kenya set up forty-one (41) education assessment and resource centres with many sub-centres. These centres provided early intervention services with assessment and appropriate placement. By 1997, 30000 children had been assessed and the majority had been placed according to their disabilities (ILO, March 2002). The status of the special education in Kenya was further enhanced by the implementation of certificate, diploma, degree, master and doctorate programme courses at Kenya Institute of Special Education (KISE); Kenyatta University and Maseno University.

Finally, the government of Kenya has enacted legislation which laid down principles and policies on people with disabilities. Disabilities Act (GoK, 2003), Children's Act (GoK, 2001) and Constitution of Kenya (GoK, 2010). The Constitution of Kenya includes specific provisions related to persons with disabilities. Despite these positive measures, performance of pupils with visual impairment continues to pose greater challenge in Braille reading and writing. That prompted this research.

1.2 Statement of the Problem

Learning to read and write present more challenges to a pupil learning Braille than it does to those learning print. The unique aspect of reading and writing for children with blindness is the use of touch. For reading the sensory organ is usually a finger or fingers of one or both hands, the development of the tactual sense provide the knowledge and foundation necessary for competence in reading Braille. When the tactual kinesthetic sense is poorly stimulated through frequent reading of Braille material and manipulation of objects, the sensory receptors at the finger tips become weak and insensitive to identify Braille characters. This not only reduce the rate of identifying the Braille character but also reduce the speed of reading. Despite the enormous effort of pupils and other stakeholders, performance of pupil with visual impairment in Braille reading and writing was still low because of the many challenges faced in learning.

1.2.1 Purpose of the Study

The purpose of the study was to unearth challenges to effective learning of English Braille for pupils with visual impairment in an integrated setting and suggest solutions to overcome them.. The ability of those pupils to read and write Braille effectively would enable them to receive and pass information, compete academically for the scarce resources with their sighted peers and thus improving the quality of their lives. However, that might not be achieved because of the many challenges to effective learning of English Braille and hence the need to provide solutions.

1.3 Objectives

The study was guided by the following objectives:

1. To assess whether the pupils with visual impairment were able to write Braille competently.
2. To find out if pupils with visual impairment were able to read Braille passage fluently.
3. To find out if accommodation strategies put in place for learners with visual impairment was suitable for Braille reading and writing.
4. To find out instructional approaches commonly used to teach Braille.
5. To find out whether teachers teaching Braille were adequately trained to teach Braille at primary school level.
6. To investigate if the number of pupils enrolled to learn Braille had an effect on learning Braille.
7. To find out whether the educational resources were available and adequate for learning Braille.

1.4 Research Questions

The study tried to answer the following research questions:

1. What were the causes of low performance in Braille for pupils with visual impairment?
2. What challenges do pupils with visual impairment face when learning Braille?
3. What were the effects of low performance of pupils with visual impairment on their academic achievements?

4. What should be done to improve on the performance of pupils with visual impairment in Braille?
5. What other factors outside the school setting affect learning of Braille?

1.5 Significance of the Study

The study was hoped to be beneficial to pupils learning Braille as their medium of reading and writing for they would be able to identify their weaknesses and improve on them so as to read effectively. In addition it benefits teachers teaching Braille for they would be able to know the weaknesses of their pupils and change their instructional strategies in order to enhance effective teaching of Braille in class.

The result of the study would be useful to educational officers who monitor and evaluate the learning of Braille in primary schools. The Ministry of Education was hoped to benefit from the study when formulating and implementing educational policies related to Braille in primary schools. Furthermore, the study was hoped to benefit Kenya Institute of Education (KIE) when developing curriculum and curriculum support material such as teaching aids. The study was hoped to benefit non-governmental organizations (NGOs) such as Sight Savers International (SSS), Kenya Society for the Blind (KSB) and Community-Based Organizations (CBOs) such as comprehensive eye services that provide educational resources for the pupils with VI. Finally, the study was hoped to generate knowledge which might facilitate further research into the subject.

1.6 (i) Limitations of the Study

1. The study limits itself to one district in Kenya, Bomet district. For a more exhaustive result, the study should have covered all the districts in Kenya. However, this was not possible due to financial and other logistic constrains.
2. It was not possible to cover the opinions of parents and other stakeholders in the education of children with visual impairment because tracing them required considerable time, finance and other logistics.
3. There was unavailability of documented literature on Braille reading and writing in Kenya.

1.6 (ii) Delimitations of the Study

The study confined itself to pupils with visual impairment who use only Braille for reading and writing, hence reducing the sample size. The teachers who were the respondents were only those who teach Braille to pupils with visual impairments, so the general education teachers were precluded as they were not directly involved in the teaching of Braille. Pupils and teachers included in the sample were those in session in their respective institutions by the time of the study. Those absent or who had completed examinations were not included in the sample. Finally, there were several other factors affecting the integration of children with visual impairments, but the study would only focus on challenges to learning how to read and write Braille.

The study would be limited to only one District in Kenya, Bomet, which was located in the Rift Valley Province. For a more conclusive result, all the integrated primary

schools in Kenya would have been studied; however, that was not possible due to financial constraints and other logistic constraints such as terrain and inaccessibility.

1.7 Assumptions of the Study

In the study, the following assumptions were made:

- a) That all teachers teaching Braille were professionally trained and qualified to teach Braille at primary school level.
- b) That there were available, adequate teaching and learning resources such as Braille text, Braille papers and Braille writers for pupils with VI to use.
- c) That the number of pupils enrolled had no effect in learning to read and write Braille.
- d) That no other factors affect the learning of Braille except those found within and outside the teaching and learning environment.

1.8 Theoretical Framework

This study was guided by:

Skinner's theory of motivation (1904-1990) and psycholinguistic theory of Smith and Goodman (1973).

1.8.1 Skinner's Theory of Motivation (1904 -1990)

Skinner in Orodho (2004) put forward a motivation theory of learning. The theory stipulates that pupils' motivation to carry out a task depends on expected reward. A positively expected reward induces positive motivation and contributes to high achievement. Negatively perceived reward leads to negative performance in Braille.

reading and writing depended on the instructional strategies, availability of resources e.g. Braille physical and social learning environment and trained and qualified teachers. These factors influenced the pupils high performance in Braille reading and writing.

The theory was found to be appropriate to the field of study because some of the perceived rewards included; being position one in class, winning a present from a teacher or parent, positive remarks from teachers and parents and promotion to the next class or group. This expected reward induces high motivation thus contributing to high performance in Braille reading and writing. However, those perceived rewards might not be realized because of the many challenges to effective learning of English Braille and hence contributing to low performance.

1.8.2 Psycholinguistic Theory of Smith and Goodman (1973)

According to Lamb (1996) the Psycholinguistic theory of Smith and Goodman (1973), stipulates that the acquisition of reading and writing is a natural process, which is an extension of oral language learning for all children regardless of their abilities. The theory stresses that all children learn to read and write in the same way as they learn to speak and listen. This implies that all children acquire reading skills through incidental learning. For instance, children acquire reading and writing skills through personal experience such as observation, and experience with Braille literature so the pattern of acquisition of reading begins with the child personal experience, listening, speaking and eventually reading and writing. However, for learners with visual impairment their personal experience is limited due to severe

visual loss and lack of Braille literature for personal direct tactual contact. This theory was found to be appropriate to the field of study because learning to read and write Braille concentrate on the development of Braille contractions. The theory was found to be appropriate to the study because the theory was used to identify challenges to effective learning of Braille by pupils with V.I. in integrated centre.

1.9 Operational Definitions of Terms

The following terms that appeared in the study would be used as defined below:

Blind: - people with severe visual loss.

Braille:- is a system of writing using dots.

Electronic device:- a device that uses electron flow in its operation e.g. TV, Radio and computer.

Impairment:- in anatomical structure or malfunction of the eye.

Integration:- Teaching pupils with visual impairment and sighted pupils together in regular schools.

Low vision: - The partial loss of vision.

Optical :- A device for producing or controlling light e.g. spectacles and magnifiers.

Reading efficiency:- Refers to how accurately one reads.

Reading:- a particular way of understanding printed word symbols.

Tactile:- A sense of touch.

Visual Impairment: - Failure to read as a non-visually impaired person because of the defects in the eye.

Writing:- The act of making words /letters for communication.

Adapted curriculum:- Modification of regular curriculum to fit learners with VI.

Assessment:-Testing of learners with VI to find their reading media.

Placement – refers to putting a learner with VI into a suitable programme.

Physical environment – those visible conditions which affect learning e.g. sitting and classroom arrangement.

Social environment – Refers to attitudes, beliefs, and practices which affect learning.

Mechanics- Refers to the movements of fingers during braille reading.

1.10 Conclusion

In summary, the background of the study, which presented the genesis of the problem, the statement of the problem, and the purpose of the study were discussed in this chapter. From the purpose of the study, the research objectives and research questions were formulated to guide the study. The significance of the study which highlighted the beneficiaries of the study were discussed. The limitation of the study which presented the constraints encountered during the study and how they were overcome were discussed under delimitation of the study. The theoretical framework which was formulated to guide the study were highlighted. The operation definition of terms which presented the meaning of terms as was used in the study were provided. Finally, review of related literature was discussed in the next chapter.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Studies to identify challenges in learning to read and write Braille have been carried out by several researchers and scholars. The chapter seeks to review the existing literature and identify clear gaps which have been addressed in the field. The following themes were developed using conceptual framework:

2.1.1 Development of Braille and Braille Reading Techniques

According to Royal National Institute of the Blind RNIB (1968), Braille is a system of embossed dots formed with one or more of the six dots in a braille cell which are arranged in two columns thus, dot 1, 2, 3 and 4,5,6 and were numbered for easy reference. According to RNIB (2000) Braille is a system of writing using dots which can be read visually or tactually for learners with visual impairment. A sign which occupies one space is termed as one space sign and a term which occupies three spaces is termed as a three space sign, dots 1 or dot 4 is termed as an upper sign; a sign containing neither dot 1 nor dot 4 is termed as lower sign.

According to RNIB (1968), the possible combination of six dots gives 63 signs, but only 46 of those are used in English Braille. A combination of these dots might be used to write letters of the alphabet, punctuation signs, contractions and work signs.

Before the invention of Braille in the 1800s, there was no effective way for people with visual impairments to be able to read and write. The section would present a brief history on the attainment to read and write by people with visual impairments. It clearly demonstrates the enormous impact that the invention of Braille code have had on reading and writing in the education of people with visual impairments and described the evolution of the Braille code to its current forms.

There is no specific definition of literacy agreed on by scholars and researchers. For the purpose of the study, literacy was seen as the ability to read and use written information and to write appropriately in a range of context, it also involved the integration of speaking, listening, viewing and critical thinking and reading and writing (Groenewegen, 2008:207). Literacy was generally tied to a specific language. Someone who was literate in English, for instance might not be literate in French or Thai. Literacy requires not only an understanding of language, but also the ability to read and write it. Written language, upon which literacy depends, most likely developed when oral communication was no longer sufficient for conveying information about a society's history and traditions from one generation to the next or about the current day-to-day activities of that society. Probably because the information that people needed was too complex to be remembered. In many early societies, only the privileged classes were permitted to read and write, and the written forms of language were used primarily for religious and mercantile purposes.

Written symbols sometimes had several meanings, the highest of which were again, learnt only by the higher classes. For example in the 10th century, in Japan, women

were allowed to use only the Japanese characters and the phonetic scripts, while “The Chinese and the Chinese scripts - which were considered more prestigious- remained the exclusive and highly prestigious medium for any serious writing among men”. In those early societies, the symbols used to convey language were visual and two dimensional, with just a few exceptions, such as the quips (knotted cords) used by the Incus of Peru. Reading and writing were of least concern for people who were blind or VI because the inability to see aroused emotion in people- fear and sympathy. People who were blind or VI were either persecuted or considered useless. (Ndurumo 1993).

Among those people who were blind who gained historical prominence were Prospero Fagnai and John Milton. Many prominent blind or person who are visually impaired were bands – musicians and poets who travelled from one place to another sang songs and recounted folklore. Ironically, the invention of printing and development of easier modes of travel lessened the need for oral tradition and “doomed that way of life for the blind bands, for people lost interest in their entertainment and their love”. (Ndurumo, 1993).

It was not until the 18th century that people who were blind were considered capable and worth of being educated. The change in attitude was the result of the works of Frenchmen: Denis Diderot and Valentin Hauy in the 18th century and Louis Braille in the early 19th Century. The works of those individuals planted the idea that people who were blind were capable of being educated and that their intellectual abilities were intact, despite their loss or lack of vision (Rex and Bekar 1995). The individuals

who contributed to the development of the system of reading and writing for people with visual impairments were Charles Barbie and Louis Braille (1809 – 1952). Charles Barbie was the first person to develop a system of reading using dots. That was a system of reading using a cell of 10 dots. Charles Barbie's system was used by soldiers to communicate at night in the battlefield. It was however, that system of using dots as a means of reading and writing that opened the way for the use of tactual sense. Louis Braille made it practical in the development of a system of reading and writing for people with visual impairments. He came up with the six dots cell used today. The new codes by Braille were accepted in 1854 two years after Louis Braille's death (Lowenfeld 1974). The development of a system of reading and writing for people with visual impairments led to the emergence of special schools for the blind in Europe.

The final adoption and codification of the system did not occur until 1932, when an agreement were signed between the British and the Americans to adopt Standard English Braille as the uniform type. The adoption were delayed for so long by what had been called the battle of the dots and the battle of contractions. The battle of contractions arose because the Americans and the British had worked out the different grades of Braille-Grade 1 fully spelled out, Grade 1 1/2 with a limited number of contractions, Grade 2 moderately contracted, and Grade 3, highly contracted. Grade 1 1/2 were an American invention based on the assumption that the more contracted Grade 2 were too difficult to learn and needed an intermediate form. Finally, after long and acrimonious struggle Louis Braille's alphabet and Grade 2 (Standard English Braille) prevailed. (Lowenfeld, 1974).

2.1.2. Mechanics of Reading Braille

This refers to the movements made by the fingers during Braille reading, pupils with loss of vision must be taught those skills, because unlike the eyes, fingers had not been stimulated by the different environmental challenges. Teaching letter or symbol identification in Braille reading could not be separated from teaching correct finger and hand use. At the same time the child was learning the sounds and names of the letters, contractions and short-form words, it was important to incorporate a programme to develop tactile perception in addition to proper reading mechanics. Although, many of the activities that were used with sighted and blind pupils showed that sighted pupils could learn to identify their symbols at a distance in a group, whereas blind pupils must have direct tactile contact with the symbol, (Wormslye and D' Andrea (1997).

Moreover, since Braille could not be perceived without movement of the fingers over the Braille symbols, teaching Braille readers the correct way to move their hands in order to locate and identify the symbols was a critical element of teaching the beginning of Braille reading. Individuals with visual impairment use different types of hand movement patterns in reading Braille. In general, the most efficient pattern was moving the two hands like scissors – the left hand reads to the middle of the line, then the right hand takes over and begins to read independently to the right. The hands meet in the middle of the line of Braille and then separate. Pupils gradually learn to use their hands independently. Initially, they might locate the beginning of the line with the left hand and read with both hands until they approach the end of the line,

when the left hand finds the next line. This technique requires both hands to have fairly equal perceptual ability.

In addition to using their hands independently, the fastest Braille readers maintain contact with the Braille characters (whether the characters include dots in the upper or lower part of the cell or both). In the development of hand-movement patterns in reading, the perception of Braille characters was the most important aspect of Braille reading. Therefore, the development of tactile perception and Braille letter recognition was needed for proper Braille reading. There was need to incorporate proper hand movement and a light finger touch with improving the ability to recognize and discriminate among Braille characters with both hands.

Beginning pupils initially tend to stop and move their fingers up and down on a character in an attempt to identify it. The practice, known as scrubbing, was a deterrent to smooth, efficient Braille reading. Pupils need to learn to identify characters by moving their fingers across them from left to right without stopping.

2.1.3 Braille Reading

According to Wormsley and D'Andrea (1997) effective Braille reading depend on hand movement pattern. The alphabet, numbers, music notation and any other symbol that appears in print could be replicated in Braille by arranging combinations of the six dots of the Braille "cell". The study focused on Grade 1 and Grade 2 of the Standard English Braille alone. The stage of learning to read, or beginning reading, was characterized by learning to decode, that was, learning sound-symbol

relationships, how to blend sounds to form words, the use of context (and, for children who have vision, pictures) to assist in recognizing words.

Part of that decoding process for Braille readers was to develop the most efficient use of their hands in reading (often reading mechanics). In addition, before pupils begin to learn, it was important to make sure that they had the most comfortable place possible for reading and writing. All pupils need to learn the symbols used in reading and writing and the sounds that the symbols represent, generally referred to as phonics. In addition to instruction in phonics, children with visual impairment need to be taught to blend the sounds of letters. These reading techniques were supported by Okungu (2005). However, this study tried to observe reading techniques used by learners with visual impairment in integrated primary schools in Bomet district in Kenya.

2.1.4 Methods of Writing Braille

In this section Wormsley and D'Andrea identified Braille writing equipment citing their advantages and disadvantages. As the students learn to read they must also concurrently learn how to write. This study focused on proper writing techniques and how learners with V.I. Use Braille equipment. Writing was both a mechanical production of the symbols of a language and a process by which meaning was conveyed to an audience or readers. A pupil with visual impairment used a brailleur, slate and stylus as an assistive device for writing. According to Lowenfeld (1974), Hall (1841-1911) inverted a mechanical brailleur writer in 1892 using features of the first commercial typewriter. The machine had a simple keyboard consisting of the cell with a space bar in between. Although many types of mechanical Braille writers were

available in different parts of the world in general and Kenya in particular, the Perkins Braille writer developed in 1950 by the Howe Press of the Perkins School for the Blind was recognized as the best designed and easiest to operate mechanical braille writer presently available.

The Perkins Braille has six keys, each representing a single dot in the Braille cell, and a space bar in the middle. Besides knowing which keys represent which dots of the Braille cell, pupils should also learn which fingers were used to press down each key. The index finger of each hand was used for dots 1 and 4, respectively; the middle fingers, for dots 2 and 5; and the fourth fingers, for dots 3 and 6. Either thumb was used to press down the space bar. Fingers should be curved, as in typing or playing the piano, to allow eventually for more speed than when the fingers were extended and stiff. All fingers were to be on the keys at the same time and exert even pressure. Proper finger placement was achieved more readily if pupils were strong enough to press down more than one key at once to form the various Braille characters. Pupils need to practice pressing the keys down simultaneously without having one or two keys lag behind.

2.2 Physical and social learning environment

This section discusses various strategies that may be used for effective learning of Braille. In an article entitled “General consideration in Planning”, Ford (1989), identify factors to consider when organizing instructions. In order to successfully teach learners with V.I., the teachers need to know when to provide additional support. It is important to know that some pupils were able to participate in general

classroom activities e.g. reading and writing of Braille without modification or support while others require modification for effective participation.

For those students who require modification, there was need to provide additional support materials e.g. brailers, Braille book, radio-tape and Braille papers. In addition, there was need to provide adaptive test to accommodate brailers and other equipment. Support may also include the use of adults or other peers when learning to read and write. Ford (1989), further pointed out when modifying materials, general education curriculum should be starting point which entail adaptations substitutions and addition of educational curriculum. The adaptation of the curriculum is done according to individuals needs. Adaptations of materials means the pupils are given the same materials as general classroom peers with different instructions. Adaptation of materials is the combination of existing materials used by sighted peers and other materials which is used to complete work e.g. use of the same science textbooks plus the assistance to read the textbooks.

Substitution is replacing the curriculum materials with alternative materials e.g. use of Braille papers instead of exercise books and radio-tapes instead of story book. The next step is the expectation of modification. This can be done by varying quantity of work expected. Caution should be taken when varying quantity of work. The next modification involve providing information in audio-tape or Braille. For learners with VI, modification involve the use of Braille, raised lines and audio tape for tactual reading. In conclusion, this study will highlight classroom modification , availability of adapted curriculum materials and strategies adapted to change attitude of pupils,

teachers, parents and the wider community towards persons with visual impairment. The modification of the physical and social learning environment for learners with VI was further supported by Muchiri and Robertson (2000) in their studies in Meru North District in Kenya.

2.2.1 Teaching the Slate and Stylus

The slate and stylus were widely used by the blind as equivalent to the pencil and paper used for note-taking. Slates and stylus, often referred to as Braille writer's pencils, was probably the most inexpensive, portable writing tool for an individual with a visual impairment (Wormsley & D'Andrea 1997). It has been criticized for being difficult to learn and teach because it requires the writer to work from right to left, so the shapes of the Braille characters were reversed when writing.

The stylus was always held in the right and the way that it was held was extremely important. The first, or index fingers, of the right hand curls over the top for the handle so that the top of the stylus rests mainly between the second and third knuckles. If the stylus was position correctly, the index finger should be able to hold the stylus in air without assistance from any of the other fingers. That slate and stylus should be used frequently, at first, to ensure the proper positioning of the first finger.

Braille reading and writing was guided by the integrated language – communication model. According to Rex and Bekar (1995), the current view of reading and writing as integrated language processes stresses that reading and writing were two inter-related components of language development and were not discrete skills to be taught in

isolation. The evolution of dots as a system of writing for persons with visual impairments went hand in hand with the invention of writing devices. The invention of the Perkins Braille in 1959 was a major breakthrough in writing for persons with visual impairment as it enables the individual to write independently. Braille along with other options like tapes, personal readers, and computers equipped with adaptive equipment, present an effective alternative and its use could enable an individual who is blind or visually impaired to be a fully literate participant in today's information driven society (Wormsley & D' Andea 1997). According to Cullen (2006), other devices available for the blind included computers, Jaws, Dolphin, and the Supernova. The use of computers was too expensive and thus pupils have limited access to it while Jaws was limited as it dealt with speech only. The next device available for persons with visual impairments was the Dolphins pen; that was a 256 MB Flash Drive containing the entire software configuration. That can be put on any computer running windows XP or Windows 2000 and with a USB port. The supernova can be used to write raised dots in Braille that would enable individuals who were not literate in Braille to translate Braille text into print. The use of those writing devices was hampered by the fact that they were too expensive. There was a time-lag between the invention of the device and the time when individuals with VI use them for communication or for writing.

2.3 Instructional Strategise to Braille Reading

According to Okungu 2005 "The process involved in reading is the same for all pupils whether sighted or those with visual impairment. The only difference between those two readers concerns the modes of sensory perception and the unique characteristics

of the embossed code. The objective of reading was to pass ideas and that applies to all people. The act of reading consisted of personal experiences, there was no meaning in the printed or brailled words but the meaning was derived from the readers personal experiences, however for the pupil with total loss of vision, that experience could be limited.

To achieve Braille fluency for pupils with visual impairments several instructional strategies had been advanced according to Okungu (2005). Rresearch studies to determine the most effective approaches has concluded “there was no best method” for teaching braille reading and writing that the classroom teacher was the most important variable in determining the most effective reading approach. According Wormsley and D’Andrae (1997), the following were some of the common instructional strategies:

2.3.1 The Basal Reader Approach

Those were instructional materials which consisted of reading textbooks, workbooks and teachers guides which were arranged sequentially. The teachers guide provide specific skills to be taught and suggested activities, the instruction tend to be teacher directed and concentrated on reading skills such as word recognition, new words and comprehension. However, that approach had a limitation because it could not present pictures to learners with visual impairments, to overcome that limitation the teacher should describe the picture verbally until the learner understood or substituted the picture with real object where possible.

2.3.2 Patterns

That approach was developed by the American Printing House (APH) to address the need to teach pupils with visual impairment to read using Braille. It consisted of stories that were meaningful to pupils with visual impairments and did not depend on pictures. According to Wormsley and D'Andrea (1997:76), "patterns were often the choice of teachers in residential and day programs for students who were blind or visually impaired". The approach could be applied in integrated program such as Bomet District Integrated Program, the approach was skill centred and concentrated on component skill required decoding symbols into word, it included additional materials such as: The Pattern Library Series and the primary Braille spelling the English Program that provide an integrated approach to learning to read.

2.3.3 Language Experience Approach

That approach was based on the use of language experiences as the basic for creating individual reading materials, in that approach the pupils dictated a text based on their experience while the teacher transcribe the stories and help the pupils to read what had been transcribed. According to Wormsley and D'Andrea (1997:76), "Although the language experience approach showed pupils how meaningful reading and writing could be, it did not expose them to any language other than what they had already acquired, "because of their limited language experience, age and visual loss.

2.3.4 The Literature-Based Approach

That approach taught reading using interesting children's Literature. It focused on meaning, interpretation and enjoyment, reading skills and taught within the context of

the literature, generally, that approach was highly motivated to the pupils as it guarantees individualized instructions, but it had a notable limitation in that the teacher might not be able to monitor the pupils reading progress. “It also required a large supply of books which span a wide range of levels and topics, which might not be all available in Braille, (Okungu, 2005). To overcome that, a trained teacher in Braille should be available to transcribe print stories to Braille.

2.3.5 Whole Language Approach

That was a child centered approach in which learning was derived from the meaning rather than from an assembly of individual parts, such as letters or words, reading and writing were integrated into every aspect of the curriculum. Pupils with visual impairment learn through reading and writing activities. It was based on a set of belief that “reading, writing, listening, speaking and thinking could not be separated and proposes a way of teaching that was based on integrating all aspects of learning through language while pupils learn language” (Wormsley and D’Andrea 1997).

Instructional strategies for that approach involve daily writing and reading activities, cooperative learning, readers and writers workshops, independent reading and writing projects, in their criticism of the approach, Rex and Bekar (1995). Thought the approach was similar to good teaching practices where reading and writing occurred in meaningful contexts and that reading and writing did not necessarily have to receive equal emphasis was in early reading and writing programs (Okungu 2005:26). That approach could be used to teach learners with visual impairment to read and write Braille contractions.

This study observes some of the instructional strategies commonly used by Braille subject teachers to determine which strategy was most effective in teaching Braille. The above methods of teaching Braille were cited by Lowenfield (1967).

2.4 Teachers' Qualifications

Individuals with visual impairment form a minority group within the general population while Braille readers within individuals with visual impairment also form a minority. In Kenya, the number of Braille readers is significantly affected by low enrolment rates. Certain factors present problems to pupils with visual impairments in learning to read and write Braille, most significant of which is lack of funds (Waihenya, 2000).

Kenya also lacks professionals in the area of special education in general (Karugu, 1994). Lack of an adequate number of trained personnel for pupils with visual impairments presents challenges to learning to read and write Braille. Although the government train teachers, the field of special education continues to experience a dire need for trained professionals.

2.5 Educational Resources

Challenges to learning to read and write Braille exist in the area of adaptations of materials for pupils with visual impairments. Although some subjects such as sciences, social studies and mathematics studied in primary schools had syllabi adapted for pupils with visual impairments in which complex psychomotor activities were replaced by more manageable ones (Waihenya, 2000), most syllabi used in

general education classes did not have accommodations in terms of adapted activities for pupils with visual impairments. Lack of funds made it impossible to provide required class level text books and leisure reading materials and to maintain Braille machines. That made it extremely hard for pupils with visual impairments to read and write Braille as fluently as needed. Although Education Assessment and Resource Centre (E.A.R.C) were involved with the identification of pupils with visual impairment, there is need to develop intensive early intervention services for infants and children with visual impairment. The benefits of early intervention can not be over emphasized.

2.6 Other factors

The importance of learning to read and write Braille to a student with VI could not be underestimated. According to the Braille information centre, learning to read and write Braille by a student with visual impairment was equal to equality. For a student with VI, learning to read and write Braille was the key to literacy, successful employment, and independence. All children need to be literate- to read, write and count in order to enjoy intellectual freedom, personal security and equal opportunities when they grow up. When children with VI are learning to read and write, Braille was the best way for them to develop skills in spelling, grammar and punctuation.

Although complex charts and graphs might be almost impossible to describe well orally, they could be clearly communicated in Braille. Braille had enabled many people with visual impairments to be employed. For a pupil with VI, learning to read

and write Braille was equal to independence that is the child was able to read and write alone without relying on readers or electronic equipment.

2.6.1 The Choice of Braille as a Reading and Writing Medium

The choice of Braille as a reading and writing medium often presented difficulty to parents, pupils and teachers. According to Halten (2002), most individuals with visual impairment fall into four categories when it comes to learning media. Some would certainly be print readers, for their vision allows them to read quickly and accurately, using regular print, large print or optical devices. Reading was not hard work for them, and they would achieve speed and comprehension rates that were sufficient for both educational and recreational reading. Other pupils would obviously be Braille readers and writers. Often those children would be either totally blind or have light perception only. Contrary to myths that have existed around Braille for many years, that literacy medium is too bulky, too slow, too hard to find. Braille is, in fact, an excellent medium for reading and writing, and was not a second-class system to print (Halten, 2002).

A third group of learners would have difficulty with both print and Braille. Those pupils often have educational challenges in addition to a visual impairment. They would explore other means of literacy. One would be auditory learning, another might be tactile symbols. For all children with VI, there would be a means by which reading and writing could be achieved in some form. That was what education was all about.

The fourth group was one which there are some misunderstanding and often confusion. Those are comprised of children who have visual impairment and have enough vision to perform some tasks and activities visually. Some parents and professionals would want those children to learn Braille. Others would advocate for full use of remaining vision, including the task of reading and writing. The confusion about that fourth group happens when we fail to consider Braille and print as being equal methods of reading and writing. If we believe one was superior over the other, we are at a risk of making serious educational mistakes with children.

What sometimes complicates the decision to be made, based on learning media assessment, was that children who would learn print could easily be provided their reading program in general education classroom. Children for whom Braille was indicated would need to be taught by a credentialed or certified teacher of the visually impaired. General education classroom teachers were not qualified to teach Braille reading and writing, nor are paraprofessionals. For the child who would learn Braille, the teacher of the visually impaired must be at his/her school every day. Recent data indicated that for a child to be successful in learning braille, the teacher of the visually impaired must be available to offer instruction in reading for at least one hour per day.

Because of the shortage of teachers of the visually impaired in Bomet, and Kenya in general, it was sometimes difficult, if not impossible, for the teacher to be with a Braille learner for an hour a day. If the teacher of the visually impaired caseload was too large or geographic area of responsibility too big, then he/she might not be

available to the child as often as needed. That is very serious problem in providing the correct and most useful reading and writing skills to those group of pupils. Sometimes, in cases where there seemed no other solution, the teacher of the visually impaired might consent to a child learning print even though Braille would be preferred.

Visually impaired pupils were fortunate to have a variety of means by which to achieve reading and writing. If teachers and parents use those choices well, then every child in Bomet in particular and Kenya in general would develop reading and writing skills to the maximum extent, and in the best medium possible. It is up to parents to know what their children need, to work together with the schools to assure that there was agreement regarding the educational services provided and to work with the teacher or the visually impaired so that children were assured of the best education possible. The study would not discuss media assessment criteria but assumed the participants in the study had been assessed and proven eligible for Braille reading and writing at the time of the study.

2.7 Summary of the Chapter

This chapter reviewed the evolution of Braille, importance of reading and writing mechanics and instructional approaches. The literature reviewed that all children both visually impaired and unsighted need to be literate – to write and count in order to enjoy intellectual freedom, personal security and equal job opportunities when they grow up. The next chapter discusses the research methodology that the study adopted.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

In the chapter, the researcher discusses the procedure and strategies that were used in the study, that focused mainly on the following sub sections, research design, research variables, location of the study, target population sampling technique and sample size, development of research instruments, pilot study validity and reliability data collection techniques and data analysis

3.1 Research Design

Kombo and Trop (2006) define research design as the scheme, outline or plan that is used to generate answers to research problems. The study employed descriptive research design as the scheme, outline or plan that was used to generate answers to research problem. The study employed descriptive research designs. The design was found to be appropriate to the study as it described the phenomenon without manipulating the subject, that was the learners' who were learning to read and write Braille.

3.1.1 Variables

Variable were mathematical quantity which represented several different amounts depending on the situation and were able to be changed. They could be classified into independent and dependent variables. Independent variable were those that could not be manipulated they remained the same in some ways in different situations while dependent variables were those which could be manipulated depending on different

situations, for instance in the study independent variable were mastery of Braille reading and writing. While dependent variables were the marks obtained in Braille reading and writing test because marks were influenced by other factors and can be manipulated.

3.2 The Location of the Study

The location of the study was in Bomet District in Rift valley province in Kenya. Bomet District is bordered by Narok District to the south, Bureti and Nyamira to the west and Nakuru District to the North East. The District is further sub-divided into divisions: Siongiroi, Longisa, Ndanai, Mutarakwa, Sigor and Bomet Central. The District is located in a high agricultural potential area in the upper zone and low agricultural potential area in the lower zone. The District has integrated primary school for learners with visual impairment. The map of the District is shown in Appendix A in the text. The District was chosen because it is one of the Districts in Kenya implementing the Kenya Integrated Education Program (KIEP) that implied that learners with visual impairment had been integrated in regular primary schools so as to learn alongside their sighted peers. So there had been concerns from their teachers over their performance in Braille reading and writing which prompted the study.

3.3 Target Population

According to Mugenda and Mugenda (2003) target population is the population to which the researcher wants to generalise the results of a study. In the study the target population was one Education Officer (E.O) in charge of Education Assessment and

Resource Services (EARS) who assesses and place pupils according to their disabilities. The research also targeted Coordinating Itinerant Teachers (CIT) who supervise teaching of Braille. Twenty headteachers of integrated primary schools where learners with VI were integrated. The study also targeted 20 teachers teaching Braille in class three to class eight. Those classes were chosen because according to Okungu (2005) pupils established reading habits at about the time of class three. Finally twenty learners with V.I. were used in the study.

Table 3.1: Target population

Sample	Population
Education offices	1
CIT	4
Head teachers	20
Subject teachers	20
VI Learners in class 3 to 5	12
VI learners in class 6 to 8	8
Total	65

The study therefore would target sixty five (65) respondents.

3.4 Sampling Techniques and Sample Size

In this section, the researcher applied stratified, raffled and purposive sampling techniques. The population was stratified into Education Officers (EOs), Coordinating Itinerant Teachers (CITs), Headteachers, Braille Subject Teachers and Pupils with VI. To obtain integrated primary schools, braille subject teachers and pupils with VI, purposive sampling technique were used because only those sampled which showed the desired characteristic was used. Where the sample size was small

such as EO and CITs, the whole sample was used for the study. To obtain headteachers of integrated primary schools, Braille subject teachers, pupils with visual impairment and integrated primary schools purposive sampling method was used because sample with the desired characteristic was chosen for the study.

3.5 Research Instruments

The objective of the study formed the basis from which the research instruments were constructed. The following instruments were constructed; research questionnaires, interview schedule, observation checklist, and researcher made Braille reading and writing test. The structured questionnaires were administered to headteachers and the Braille subject teachers as shown in Appendixes B and C respectively. The questions to be used in the questionnaire were varied to include structured or close ended and unstructured or open-ended questions.

Structured questions provided a list of options (multiple choices) from which the respondents, selected the answers that best described their situation. Where it was not possible to exhaust all the possible alternatives, then the researcher included a category of “others.” While unstructured or open-ended questionnaires were those which consisted of unprompted options, in other words there were no predetermined set of responses and the participants were free to answer however they chose. The researcher conducted interviews with all the respondents except the pupils that were aimed at supplementing other research instruments in filling the gaps that had been left out by the questionnaires. The researcher further prepared an observation check list as shown in appendix D. That provided a guideline when observing the

availability, condition and adequacy of educational resources. Finally, two-researcher made Braille test were set, one for class 3-5 and another for class 6-8 as shown in appendix E so as to assess the reading fluency and writing competency of learners with VI.

3.6 Pilot Study

Once the research instruments had been constructed, the researcher piloted them in Bureti District on a small scale. The district was chosen because of implementing Kenya Integrated Education Programs just like Bomet District. The questionnaires were pre-tested on a small selected sample which was identical to the actual samples in the study. The sample size used in pre-testing were:

Table 3.2: Pilot Sample

Sample	Numbers
E O in charge of E.A.R.S	1
CIT teachers	1
Head teachers	4
Subject teachers	4
VI learners in class 3 to 5	3
VI learners in class 6 to 8	3
Totals	16

Sixteen respondents were used in the pilot study which constituted 25% of the actual population in the study. The purpose of pre-testing questionnaires was to improve on it's quality such as increasing or reducing the spaces, paraphrasing the sentences or removing ambiguous sentences.

3.6.1 Validity

In this part, the researcher tried to assess the validity of the questions formulated in the questionnaires. According to Orodho (2004), validity is the degree to which empirical measures or several measures of the concept, accurately measures the concept. For the purpose of the study, a panel of three teachers experienced in teaching Braille assessed the relevance of the content used in questionnaires developed. They examined individually the questions in the questionnaires so as to find out if the questions were measuring what they were supposed to measure. Such as if the wording was clear, if the questions were provoking a response and if the researcher was biased. That in turn increased the quality of the questionnaire and provided feedback to the researcher.

3.6.2 Reliability

Here, the researcher tried to determine the reliability of the questionnaire developed. According to Orodho (2004), reliability of measurements concerns the degree to which a particular measuring procedure gives similar results over a number of repeated trials. To determine the reliability of the questionnaire developed, the following procedures were followed. The developed questionnaire was given to one E.O, one CIT, four head teachers and four subject teachers. The answered questionnaires were marked by the researcher and two assistants. The same questionnaires were administered to the same group of subjects after a fortnight and the questionnaires were marked.

A Pearson's product moment formula for the test pretest formula was employed so as to calculate the co-relation, co-efficient for the answers in question one and three in order to establish the degree to which the content of the questionnaires were reliable. A co-relation co-efficient of 0.8 was considered high enough to judge the instruments as reliable for the study.

3.7 Data Collection Techniques

The principal researcher supervised and conducted the collection of the data in the field with two assistants. The data was collected using interviews, questionnaires, observation checklist and researcher – made - Braille test. During the research the researcher visited each integrated primary school at least twice. The first visit was meant to establish co-operation from the school administration and staff. Once the co-operation had been solicited, the researcher booked an appointment for briefing and presented the questionnaires to the respondent.

The second visit was meant to collect the questionnaires and carry out the interview. The face to face interviews was meant to fill the gaps left out by the questionnaires. Thereafter, the subject teachers were asked to teach Braille so as to check on the instruction strategies used and after the lesson the subject teachers were asked to administer two researcher-made-Braille reading and writing test, so as to evaluate the reading fluency and the writing competency of the learners. The scripts were then marked by the researcher and the subject teacher and were returned to the learners. As the test progressed the researcher tried to observe the physical arrangement of the learning environment and the availability and adequacy of the teaching and learning

resources in the school in order to establish whether the learning environment was conducive for learning for pupils with VI.

3.8 Data Analysis

The data collected from the field were analyzed quantitatively. That was the use of descriptive statistics or words to describe the data same word. That was the use of numerical values to describe the data e.g. by computing mode, mean and percentages of the data collected. The data collected were then presented using statistical tables, pie charts, bar graphs and diagrams and the results were drawn from data.

3.9 Logistical and Ethical Considerations

Logistics were those processes, activities or actions that a researcher must address or carry out to ensure successful completion of a research project. Mugenda & Mugenda, (2003). This involves preparation before, during and after the research.

The research was guided by the following ethical considerations

- 1) The information provided was treated with confidentiality so as to maintain the secret of the source of information.
- 2) The respondent was to be anonymous in order to keep the secrecy of the source of information.
- 3) The researcher sought permission from the MoE, through Kenyatta University graduate School because it is mandatory when carrying out research in Kenya.

- 4) The researcher ensured that the research did not cause physical and psychological harm to both the respondent and the researcher avoided imparting any harm to subjects.

In summary, the various methodologies used when writing the research were discussed in-depth for instance the research design which described the whole plan used to generate answers to research questions were discussed in depth. The independent and the dependent variables were also highlighted under the sub-topic variables. The location of the study which showed the area where the study was conducted was described and illustrated with a map.

The target population which was the population used to generalize the result of the study was discussed and illustrated with tabular statistical table. The sampling techniques which described ways of obtaining sample size were greatly discussed. The research instruments which included the tools used for collecting data were described and explained ways of constructing them. The pilot study which explained how the developed questionnaires were tried out on a small scale so as to improve the quality of the developed question were discussed at length. The validity and reliability of research instruments and methods of data collection were described. The method of data analysis, logistical and ethical consideration were finally discussed.

CHAPTER FOUR

DATA PRESENTATION AND INTERPRETATION

4.0 Introduction

In the chapter, the data collected from the research study was extensively explained. The two questionnaires were analyzed separately in the order of: Head teachers and teachers' questionnaires. Thereafter the results of the researcher's Braille test was analyzed and the results interpreted. The description was based on the following themes:

1. Performance in Braille reading and writing tests.
2. The physical and social learning environment.
3. The instructional strategies
4. Teachers' qualification
5. Educational resources
6. Other factors.

In analyzing the above data the discussion was mainly based on the research carried out in Bomet District integrated primary schools between the period of 19th November, 2007 to January, 2009 and was related to existing literature concerning Braille reading and writing effectiveness for learners with VI and a thorough interpretation of the data collected during the study cutting across the above mentioned themes.

4.1 Performance in Writing and Reading Tests

The researcher administered two tests to be written in Braille. One test was for learners with VI in class 3 to 5 and the other was for the learners with VI in class 6 to 8. The test for class 3 to 5 was written in Braille grade one fully spelt out and the learners were expected to write contractions or words representing some of the words in Braille. When the test was administered, the learners displayed the following behaviours. Some had difficulty in inserting the Braille paper into the Brailler. For some learners, the Braille papers stuck into the Brailler and spent more time in trying to remove the Braille paper.

The total number of words written correctly by each learner was counted, those words which the learner attempted but did not write correctly and those words that were not written completely were also counted and then the average for each category was calculated. The time taken by each learner was summed up and divided by the number of learners so as to get the average speed taken for each word and the total number of time taken.

Table 4.1: Writing competency test for class 3-5 for learners with VI

Words presented	30	100%
Av. Words written correctly	12	40%
Av. Words attempted but not written correctly	8	26.7%
Av. Words not written at all	10	33.3%
Av. Time taken in minutes	20	
Av. Speed in words per minute	2	

As shown in the above table, out of 30 words presented, 12 words (40%) were written correctly, 8 words (24.7%) attempted but not written correctly and 10 words (33.3%) were not written at all.

The above data is illustrated using a pie chart as shown below

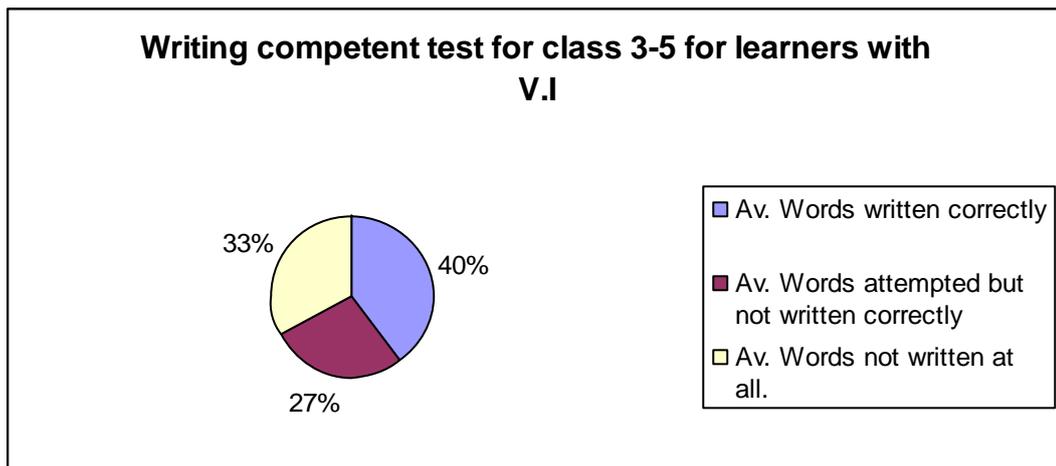


Figure 4.1: Pie chart showing writing competency.

The second Braille writing test for learners with VI was administered to 8 learners in class 6 to 8. The tests were written in English Braille grade one and the learners were to write the answers in English Braille grade two that were with contractions. The total number of words written with correct contractions were counted, words attempted but not written correctly and also those not written at all were also counted for each learner and the total for each category were summed up then the results were then divided by eight learners.

Table 4.2: Competency in Braille writing for class 6 to 8 for learners with VI

Words presented	110	100%
Average words written correctly	65	59.1%
Average words attempted but not written correctly	25	22.7%
Av. Words not written at all	20	18.2%
Time taken in minutes	30	
Av. Speed in words per minute	4	

As shown in table above, out of 110 words presented, 65 words (59.1%) were written correctly, 25 (22.7%) incorrectly and 20, (18.2%) not written at all. The speed average in response to question 10 in teachers' questionnaire. Eighteen teachers that comprised 90% of the teachers interviewed said that the school had a promotion policy where learners with VI were promoted to the next class basing on the marks obtained in the examination test. Because of that, those who did not meet that requirement were forced to repeat the same class.

From the study carried out, it showed that the number of learners in class 3 to 5 were many, that is, they were 12 in number as compared to eight in class 6 to 8. That could be attributed to the repetition of the same class. It was also observed that some of the learners did oral test that was not in line with writing and reading Braille contributing to poor performance of the learners with visual impairment. Different impact on the class mean that according to the response to question seven in the teachers questionnaires, three teachers (15%) of all the teachers agreed that the performance of learners with VI improved the class mean because the learners with VI in their classes performed very well in the exams. While 12 teachers (60%) believed that there was no change in the mean score because the numbers of learners with VI were a

minority in class. Therefore, their performance had no impact on the class mean. Finally, five teachers (25%) responded that the performance of the learners with VI reduced the class mean that could be attributed to the lack of enough learning facilities and equipment.

To assess the reading fluency of the learners, the researcher administered two Braille reading tests, one for class 3 to 5 and another test for class 6 to 8. The teachers of Braille presented to the learners a Braille storybook which the learners normally used as a class reader, the learners in class 3 to 5 were then asked to read (350) words from the storybook while those in class 6 to 8 were asked to read (450) words. During reading, learners were observed to display the following habits:

1. Five took an upright posture but when tired, they would lean back while the rest would take up an upright posture with their elbows slightly touching the edge of the table.
2. Seven used the index figures of both hands to read especially when the text seemed easy while five of them used one index finger to read especially the left index which appeared to be more active than the other.
3. All the learners applied light touch on the dots but when confronted with a difficult word, five of them rubbed all over the dots.
4. Some of them had difficulties with tracking a Braille line and sometimes missed line and words. In the test conducted, the total number of words read correctly were counted correctly for each of the twelve learners and the total number of words read correctly were later summed up for the learners, that procedure was

repeated for those words attempted but not read correctly and those that were not read completely. And then, the average was calculated.

Table 4.3: Fluency in reading test for class 3-5

Average words presented	350	100%
Average words read correctly	150	42.9%
Average words attempted but read in correctly	120	34.3%
Average words not read at all	80	22.9%
Average time taken in minutes	30	
Average speed in words per minute	11.7	

As shown in the table above, out of the 350 words presented, the learners read 150 (42.9%) correctly, 80 (22.9%) incorrectly and they attempted 120 words (34.3%).

The above data were illustrated further using a bar graph as shown below.

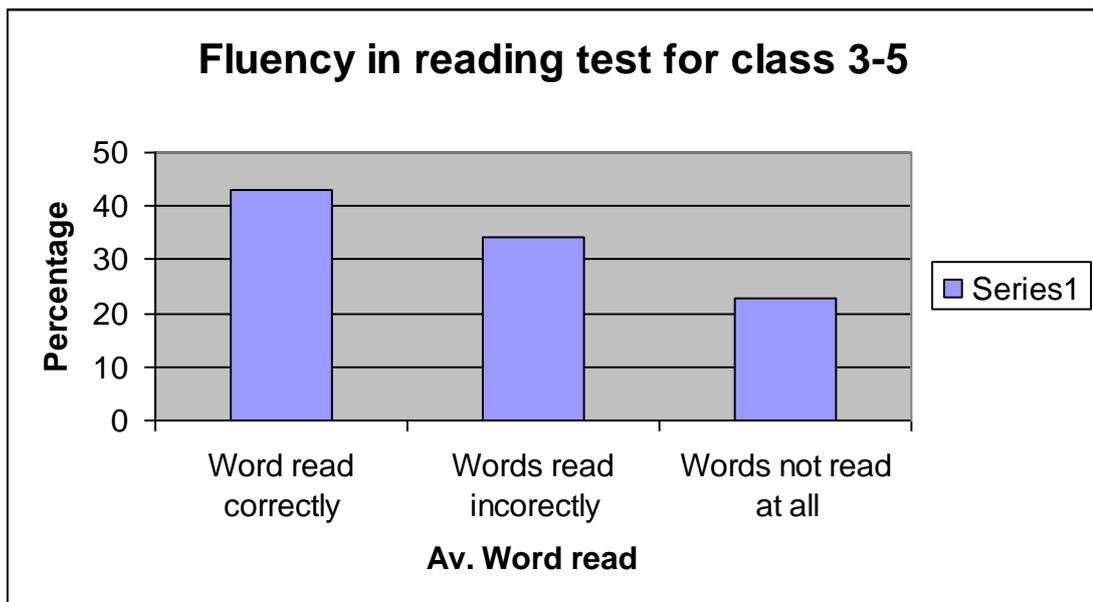


Figure 4.2: Fluency in reading test 3-5

The second test was administered to eight learners in class 6 to 8. They were asked to read Braille, storybook from their class readers for 450 words. Every learner was given a chance to read and the researcher counted the number of words read correctly, number of words attempted but read in correctly, and words not read at all. The tests were timed and the time taken by each learner was recorded. Later, the researcher calculated the average of words in each category and the average time taken in each word. The results were as shown in the table below.

Table 4.4: Fluency in reading test in class 6 to 8

Words presented	450	100%
Average words read correctly	260	57.8%
Av. Words attempted but read incorrectly	140	31.1%
Av. Words not read at all	50	11.1%
Av. Time taken in minutes	30	
Av. Speed in words per minutes	15	

As shown in the table above, out of 450 words presented, they read 260 words (57.8%) correctly, attempted but not read incorrectly 140 words (31.1%) and 50 (11.1%) of words were not read at all.

The above data is illustrated using a bar graph as shown below:

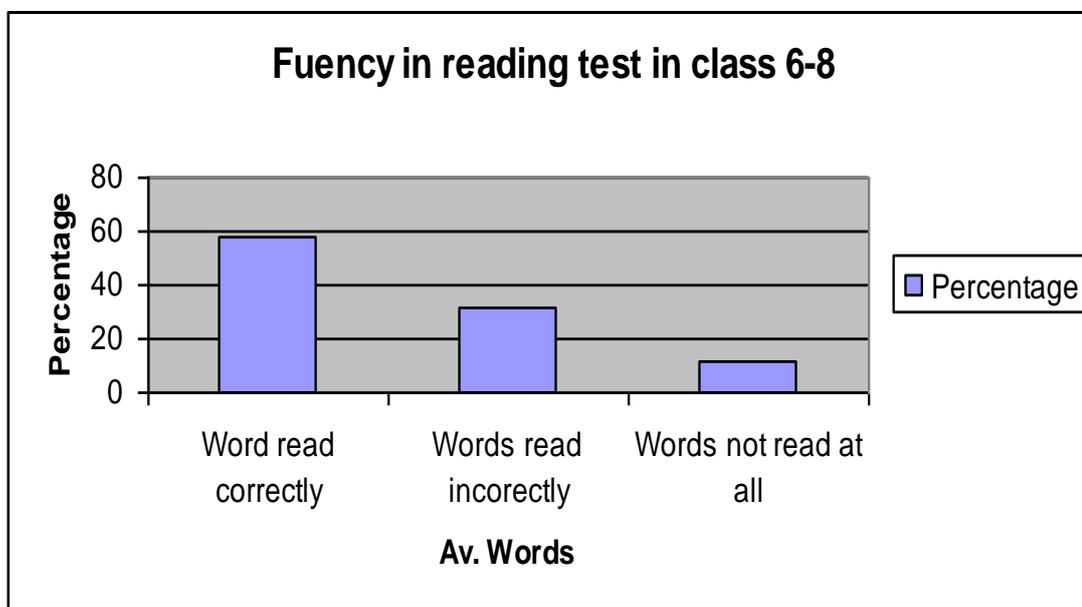


Figure 4.3: Fluency in reading test in class 6- 8

4.2 Physical and Social Learning Environment

During the time of study it was observed that the physical learning environment was not conducive for the learners to carry out their studies effectively. That was because of inadequate teaching and learning resources, the frequent breakdown of Braille equipment and lack of trained artisan to repair the equipment such as Brailier and Thermoform machines. Among the twenty schools visited it was discovered that, twelve of them occasionally repaired their equipment while eight schools only repaired when they broke down. Their argument was that there was lack of qualified artisans to repair them.

The size of the desk to accommodate the Braille equipment was observed to be too small in that of 20 schools only 3 schools had a well structured desk to accommodate the equipments. It was further observed that classroom arrangement was not structured to accommodate learners with visual impairment that the sighted and V.I. pupils were sharing the same desks, therefore Interfering with reading effectiveness. The items in the classroom were not labeled in Braille for easy identification for learners with VI to enhance the smooth flow of their learning.

It was also observed that the learning centers in class such as nature corner, Braille equipment corner, shop corner were not well arranged in the seventeen schools to allow easy accessibility for the learner with VI. That inhibits the rate of learning to read and write Braille resulting in poor academic performance and resulting in repeating some classes causing delay in completion of the learning process as compared to the sighted peers. That was because of lack of competent teachers to organize the structures in the class, the attention paid to the VI learners by the same teachers was too low as compared to other peers. For instance, one teacher told the researchers that “How can I pay my full attention to a VI learner of which I didn’t have enough skills to handle him!” That showed how VI learners were rated by the non-trained special education teachers.

In an interview, Education officers’ response was that they only sensitized or educate parents, community, pupil and other stakeholders upon the enrolment of learners with VI in the regular schools or when consulted by the affected parents. That implied the EOs didn’t pay much attention to the learners with VI and that they had low esteem

towards the learners. Consequently, the negative attitude continue to persist in the society thereby limiting the concerned learners to fully exploit their talents in reading and writing in Braille. It was also observed that many pupils, teachers, parents and other stakeholders still discriminate learners with VI. Learners with visual impairment were seen as socially and physically less capable making them to suffer from neglect and rejection. So their needs were not adequately gathered for by the parents and the community as they were seen as a burden. That they could not learn independently making the learners with visual impairment to have low self esteem and hence have poor performance in reading and writing.

When the head teachers were asked to explain how often the parents visited the school to access the learners progress, their response to question number five in the head teachers' questionnaire were as shown below;

Table 4.5 Parents' Visits to School

Visits	No	Percentage
Always	2	10
Occasionally	4	20
Rarely	14	70
Total	20	100

From the table above, it showed that there were 14 parents who rarely visited their pupils in school in order to assess their progress. That showed neglect and rejection towards the children. That explained why they delay in the payment of school fees or providing other support materials that would help to enhance the performance of the

learners. Of the twenty parents, sixteen of them would opt pay for their sighted children first and later for the learners with VI or would not pay at all.

On the research carried out amongst, teachers teaching Braille, it was established that the attitude of non-special education teachers towards Braille readers at the inception of integration was negative. In fact, they perceived that learners with VI cannot learn in a regular school like other sighted pupils in that they could lower the mean score of their subjects in a given class. Also, they felt that integration would only benefit special education teachers who earn some allowances and they were not included. Some even sabotaged the program so that they could be seen as a dismal fiasco consequently the program would be closed. The number of visits by parents to schools to assess the performance of their children is illustrated using a pie chart below.

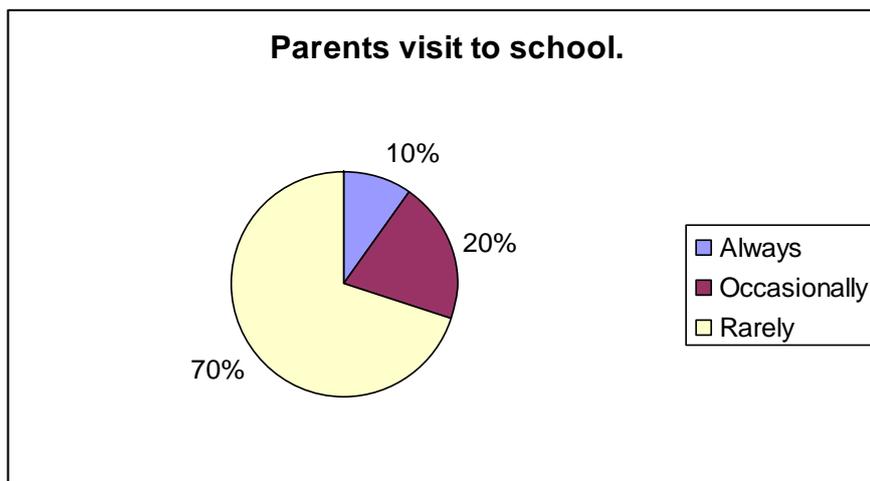


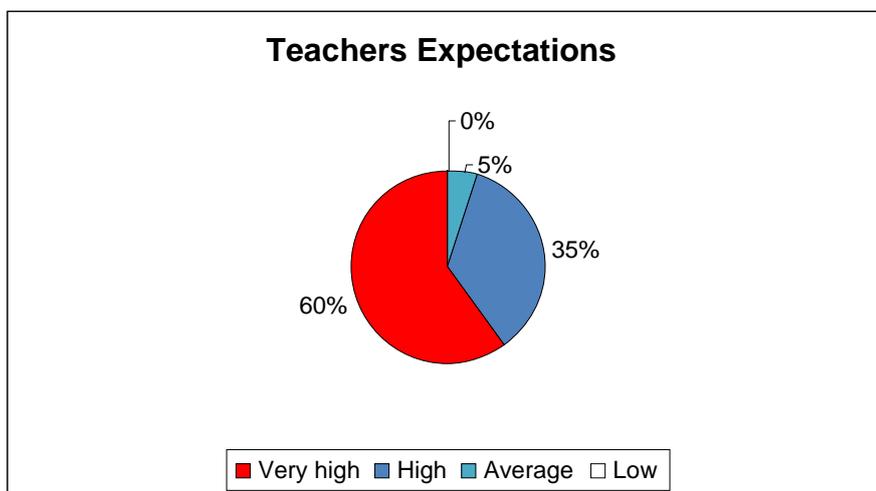
Figure 4.4: Number of visits by parents to school

In response to the question 15 of the teachers' questionnaire, the findings were as follows:

Table 4.6: Expectation of Teachers

Expectation	Number of Teachers	Percentage
Very high	0	0
High	1	5
Average	7	35
Low	12	60
Total	20	100

That showed that 60% of the teachers who responded to Question no.15 had low expectation of pupils with VI. Some of their reasons were; the learners with VI were lower achievers because after sometimes still they couldn't write and read Braille fluently, however, 5% already believed that the learners with VI could perform even better than the sighted given the necessary educational resources. The above analysis was further illustrated as shown in the pie chart below.

**Figure 4.5: Teacher's expectation**

4.3 Instructional Strategies

The role of the teachers who teach learners with visual impairment to read and write Braille included; to show learners how to track Braille lines for instance on how to track on a single line and to change from one Braille line to the next. The other role was to train learners to use both index fingers when reading Braille and not to rub on the dots. To prepare relevant teaching aids in order to enhance learning that include the use of flashcards, tactile graphics, Braille books and talking books to encourage learners in order to improve the reading fluency with minimal teachers supervision. To also assist in individualized education program (IEP) in order to cater for individual needs and to motivate learners with VI whenever they read fluently. Also motivate those who have problems in reading and writing Braille competently. So as to meet the said objectives, the teacher had to apply different instructional strategies based on the cognitive levels of the learners. The available resources and the mastery of the given instruction strategy by the teacher, therefore the teacher can either use Basal readers approach, pattern approach, whole language approach, language experience approach, literature based approach or any other suitable instructional strategy.

From the research carried out in Bomet District integrated primary schools the findings are as shown in the table below;

Table 4.7: Instructional strategies

Instructions strategy	No of teachers	percentage
Basal readers approach	10	50
Pattern approach	2	10
Whole language approach	7	35
Language experience approach	1	5
Literature based approach	0	0
Others	0	0
Total	20	100

During the research, teachers were given ten minutes to teach Braille using their preferred instructional teaching strategies, ten of the twenty teachers sampled which constitute 50 percentage of sampled teachers preferred using Basal Reader approach. Which according to Wormsley and Andrea (1997:73), means “Basal reader approach constitute a comprehensive series of reading textbooks, workbooks, and teacher’s guides, all arranged sequentially.” So, the teachers first introduce the lesson by stating the specific skills to be taught and suggested learning activities. Then the teacher presented the learners with English textbooks then the teacher directed the learners to read the text and to identify letters, words and vocabularies used in the text. The objective was to test on the area either recognition, word recognition and comprehension skills of the learner. The teacher then evaluates the learners ability to read and comprehend words and correct their weaknesses.

During the lesson, the learners were enthusiastic in searching for words, contractions in the text. Of the twenty learners evaluated, 30% were able to read and comprehend the passage in the Braille fluently, they were able to comprehend words and letters. As observed, the 30% of the learners were a small number which implied that the teaching were ineffective and some of the limitations that were observed include; in

the teaching of a story, for the learner to easily comprehend the learner had the fore-information in pictures, which were not available to the learners with VI, that made many learners to be low achievers. It was also observed that, in fourteen schools there were no Braille textbooks at all, they used the teacher's copies making the learning to be slow and ineffective. And where the textbooks were available in Braille in the six schools, it was either insufficient or not all the series were available and even when the series were available, it was beyond the class level of the learners. In the teaching of vocabularies, it was observed that the vocabulary, found in the print copy might not necessarily had the specific braille contractions in the introduction.

Second, two of the respondent teachers which was equivalent to 10% of the teachers teaching braille used pattern approaches which were designed to overcome the shortcomings of the Basal Readers Approach according to Wormsley, D. P. and D'Andrea, F. (1997). that were developed to address concerns about teaching blind and visually Impaired learners to read using braille that provided for controlled introduction to the braille contractions and contain stories that were particularly meaningful to learners with visual impairment and were not dependent on pictures.

During the lesson, the teacher introduce the text then tried to examine if the learners had had the experience that would allow them to understand the text. The teacher then asked learners to identify the Braille contractions in the text because that approach was skill-centred that require learners to translate symbols into words. Later, the teacher evaluated the learners to assess the effectiveness of the approach. It was observed that, 95% of the learners interpreted the symbols correctly implying the method used were very effective though, only two teachers used that method because

the approach required the use of the pattern library series which were only available in one school in the district. During the interview with the two teachers, the series used were locally improvised to suit the learners and improve their reading efficiency. It also appeared that it was difficult to incorporate pictures to enhance comprehension skills because the approach did not involve the use of pictures during the lesson.

The whole language approach was used by seven teachers which was equivalent to 35% of the respondent. That approach according to Wormsley and D'Andrea (1997:78,) was a philosophy of learning in which learning derives from the meaning, rather than from an assembly of individual parts, such as letters or words, and reading and writing were integrated into every aspect of the curriculum. Students learn through daily reading and writing activities such as oral reading, journal writing and language experience activities. Mistakes were not seen as errors but as part of a learning process.

In using that approach, the teacher provided the reading materials, then instructed the learners on what to read, picked the learners who would read aloud, where two learners or more were seated, they were allowed to share reading while the teacher guided the reading process and the learners did independent reading and then the teacher evaluated the learners' ability to respond to the used language in the text critically and thoughtfully because that approach was based on the idea that reading, writing, listening, speaking and thinking could not be separated so it was based on integrating all aspects of learning through language while students learned language (Smith & Goodman,1973).

During the lesson, it was observed that the learners were highly motivated to learn and ask questions in a regular school that was a result of individualized instruction which catered for the needs of each learner depending on their daily language experiences and also that the approach was integrated in every aspect of the curriculum making it possible to be used by different subject teachers hence complementing one another. However, that approach had some limitations because it required the teacher to produce great deal of materials which the school could not adequately provide. That method also created dependency on the teacher since the teacher must be readily available literally throughout the school day which might not always be possible.

From the above table, only one teacher used the language experience approaches which constituted 5% of the respondents, in that approach; the learner dictated a text based on his or her own experiences. That approach guaranteed that the text was meaningful to the learner, and that the vocabulary and complexity of the text were at the learner's level and that the learner had the background to understand it. The teacher sequentially introduced the lesson by asking the learner to narrate a story, then the teacher transcribed the story in Braille for the learners with visual impairment to use, then the teacher asked the learners to read the story over and over again that the story developed should be at the learners level of understanding. Since the approach was unstructured, the teacher now ensured that all reading skills were present.

Though, that approach was used by 5% of the teachers interviewed, the approach did not expose learners to any language other than what they had already acquired. Thus

if it had to be effective it must be used with other approaches for teaching reading. The learners were less motivated to read since the learners were not exposed to new language other than what they initially knew. In the literature based approach, none of the respondent used it. That approach teaches reading using interesting children's literature zeroing in on meaning, interpretation and enjoyment. The approach was highly motivating because learners were exposed to a variety of learning activities. However, no teacher chooses the approach because it required a large supply of story books in the classroom which were not available in the integrated setting in Braille for a child who was a Braille reader, that approach made it difficult for the teacher to introduce contractions since the storybooks chosen by the learners might be at a variety of levels.

The above analysis of the instructional strategies commonly used to teach braille was illustrated using the bar graph as shown below.

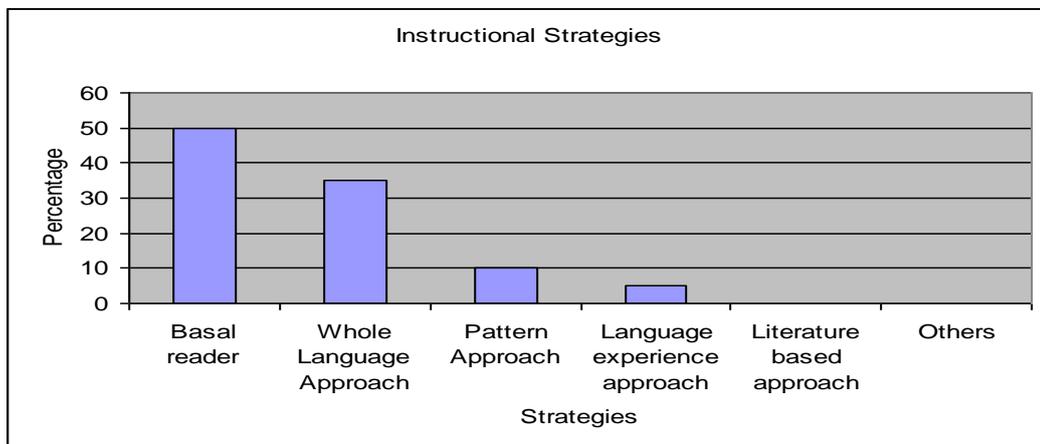


Figure 4.6: Instructional strategies

4.4 Teachers Qualification

The study carried out in Bomet District integrated primary school established that many teachers were not professionally qualified to teach learners with visual impairment. Table 4.8 below shows that the number of teachers decreases as we move from the certificate to degree level as indicated below:

Table 4.8: Qualification of Teachers

Education Qualification	Male	Female	Total	Percentage
Degree in special education	1	0	1	5
Diploma in special education	5	7	12	60
Certificate in special education	2	3	5	25
Others (short courses, seminars)	1	1	2	10
Total	9	11	20	100

From table 4.8, 7 teachers who teach Braille in the district were holders of certificate, awarded after attending Kenya Institute of Special Education (KISE), or have attended seminar organized by Ministry of Education and Kenya Society for the blind (KSB). That implied that those teachers were not adequately trained to teach Braille as the duration of the given course was limited to cover adequately the scope of Braille syllabus. Thereby, leaving the teachers half-baked graduates who in turn can neither braille nor debraille. On the other hand twelve out of 20 teachers were diploma holders who constituted (60%) of all teachers teaching Braille. That large

number could be attributed to the KISE distance learning program that was implemented between 2003 to date, which led to many teachers training in special education. However, many of them are still inexperienced in teaching Braille and some are pursuing degree programs which have just been posted to the primary school but their impact has not been felt. In addition, some are pursuing degree programmes because they not only teach Braille but also teach other regular subjects thus being overworked to the extent that they neglect learners with VI. The degree holders constituted 5% which was equivalent to one teacher in the district. When interviewed, the respondent replied that “Yes, the job was not paying. I have to go an extra mile to cover Braille lessons on top of the normal thirty five teaching lessons, in a week.”

The poor pay coupled with too much work, teachers with under graduate degree tend to take up employment in other institutions that offer them better pay and better working conditions thereby reducing the number of postgraduate teachers to zero in primary school level.

4.5.1 Availability and Adequacy of Education Resources

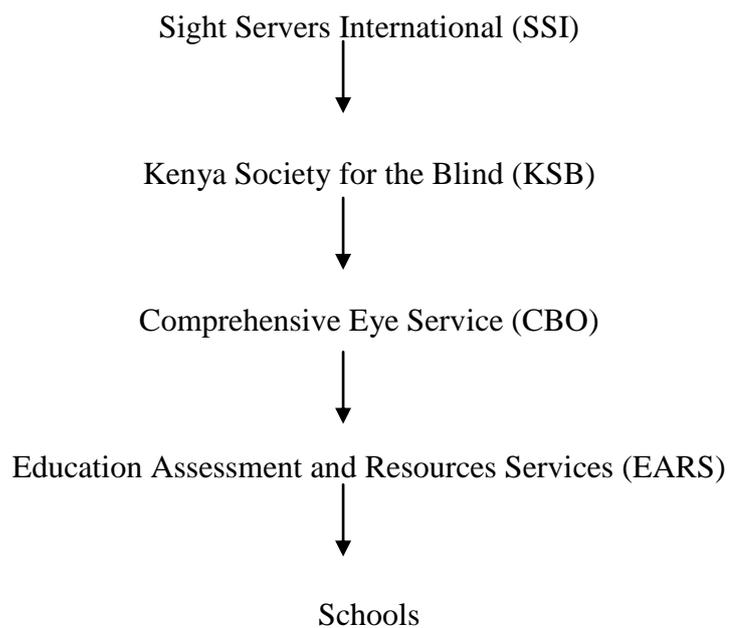
In an interview with the CIT questionnaires, the coordinating itinerant teacher responded that there were not enough learning resources such as Braille books, Brailers’ Braille papers, talking books and tactile graphic.

During the research, it was observed that only 2 of the 20 integrated primary schools had resource rooms where those equipment were kept but they were not enough. Lack of those resources had contributed to dismal performance in Braille reading and

writing, some of the reasons that were cited by the CIT for inadequacy of those resources included; delay in publication and supply from African Braille Centre (ABC), the coordinator noted that some of the Braille copies were printed two or more years after printing the first one in print. Also, the Braille copies were not available in the local market for the parents of learners with VI to buy; financial constraints had also contributed to shortage in supply of those learning materials.

The Education officer's in an interview said that learning materials were supplied through the following channels:

Figure 4.7: Supply of learning materials



That arrangement was highly bureaucratic and delayed the supply of the equipment to the learners and the cost incurred in the delivery of the materials is high.

4.5.2 Adapted Curriculum

These are group of activities linked between the teacher and the learner organized in such a way to achieve education goals previously set by the teacher, the learning organization or the curriculum specialists such as Kenya Institute of Education.

In some situations the curriculum was used to correctly diagnose learning problems such as Braille reading and writing and restore connection between the teacher and the learner. While in other situations it was conceived as a framework that provides external settings for the learning process such as Braille reading and writing. However, learners with visual impairment could not benefit much from regular school curriculum because it was not designed to suit them. Therefore, there was a need to adapt the regular curriculum in order to meet the unique needs of learners with VI.

Adapted curriculum means restructuring or modification of the regular curriculum to suit learners with visual impairment. Some of the modifications included the use of Braille textbooks, tactile graphics and talking books to enhance effective learning for the learners with VI. However, during the research it was discovered that, 90% of the schools use regular curriculum for teaching both the sighted and learners with VI. Consequently, learners with VI were disadvantaged in that they rely on their sighted teachers and peers to read printed books for them. Sometime the teachers were forced to administer oral test because there were no transcribers to Braille and debraille their work.

It was also observed that, in Bomet District, there was no school with Thermaform machine. They relied on, only one Thermaform machine from Kericho District which also served five other districts at both primary and secondary school levels. The education officer during face-to-face interview said that any material that need to be brailled and produced in large numbers needed to be taken to Kericho for brailing which was expensive. Therefore, lack of adapted curriculum had significantly contributed to poor performance in Braille reading and writing and had rendered learners dependent.

4.5.3 Funding of Education for Learners with VI

To the responses of question 9 headteachers questionnaire included Non-Governmental Organization (NGO), Ministry of Education, parents, religious organizations and other well-wishers. NGO's such as Sight Savers International pay in terms of buying equipment such as Brailers, Braille paper, thermoform machines, computers and talking books. In addition, SSI finance in-service training for teachers who teach Braille and organise Braille proficiency training seminars for learners with VI. However, the dependence of NGOs was not sustainable as they sometime withdrew their support thus paralyzing the teaching of Braille. That reliance on NGOs for the educational learners with V.I had made it charitable and benevolent rather than a basic right.

Ministry of Education (MOE), on the other hand, supplement the education of the learners with VI by organizing seminars and short courses for the special education teachers in order to improve Braille proficiency. It also provides money through the

Free Primary Education Program (FPE) to be used in buying the necessary support material. During the interview with the head teachers in the integrated programmes across the district, in 2007, ten schools received Kshs.2000 per child with VI, six schools got ksh.4,000 per child with VI and the remaining schools got 10,000 per child annually. In 2008, only two schools were funded at the tune of Kshs. 5,000 each and the rest didn't receive any amount. Therefore, the funding of MoE was inadequate and irregular making the running of the program difficult. The ministry didn't specify clearly to the teachers how the money was to be spent, so some spent on buying furniture, school uniforms, and other basic needs like soap, gumboots, shoes etc. that couldn't improve on the performance of learners with VI.

It was also noted that parents paid for the education of their children with VI. However, when interviewed, 80% of the headteachers said that many parents live in abject poverty and couldn't afford to pay school fees for their children with VI and the few who were able paid first for the sighted children at the expense of those children with VI.

So some of the headteachers, viewed that due to these financial constraints it has led to poor performance of learners with VI and in the effort to sustain the programme, some headteachers had hiked school fees for other sighted learners so as to cater for learners with VI. While others raised money through donations, parents, and even from school income, generating projects such as farming and bee keeping, etc.

4.6 Other factors

In the section, the researcher sought to determine the reading fluency and the writing competence of the learners. To achieve that, the researcher administered made Braille reading and writing test. In that case, reading was the process of constructing meaning through interacting among the reader's experience, the information in the Braille test and the content of what was being learnt. That process incorporated, developing of Braille letter sounds and words correctly, comprehension of what was being read in the Braille code, the reading media of learners with visual impairment had to be assessed and determined on the degree of visual loss. According to educational officer's interview the reading media for learners with visual impairment was determined by the professional team. That panel consisted of teacher aides, Braille transcribers, physiotherapists, mobility instructors, social workers educational psychologists, and low vision therapists who determine placement and the learning media for learners with VI. The purpose of constituting these professionals was that the choice of Braille as a reading and writing medium often presented difficulty to parents, pupils and teachers since individuals with VI fall in different categories according to Hatlen (2002). Some would have to use the print media, others would have to use Braille, others would have to use the auditory learning media while the rest have to use tactile symbols depending on the nature of their disabilities.

The education officer in Bomet District revealed that to constitute that professional team was an uphill task because some professionals were not found within the district. Therefore the education officer liaises with Tenwek Hospital, Kikuyu Eye Unit and sometime Moi teaching and referral hospital for visual assessment and screening at

the expense of the parent. As a resulting of that poor assessment procedure, some learners were sometime placed in programs which they didn't benefit from it, for instance there was one incident observed in the field where a learner with multiple disabilities was placed in integrated primary school for five years but later it was discovered that he could not benefit from the program because he could not read and write Braille fluently which called for re-assessment and now placed in a vocational school at Sikri in Nyanza.

Once the learning media had been determined the learners were placed in different educational program according to the data collected from the interview with educational officer in Bomet District-Kenya. The learner's were placed in a room with all the supporting materials that would help learners with V.I to learn Braille with ease. Such materials include Brailleurs, slate and Stylus, Braille textbooks and talking books. During the research, it was observed that only the schools with three learners had well-equipped resource rooms. Those rooms were either curved out from the library or the classroom. The learners were excluded from other sighted peers when learning to read and write Braille. However, they were allowed to interact with other peers outside the classroom. That program, though it is quite effective when teaching Braille segregates the learners from the rest making them to have low self esteem thus impeding Braille reading.

The second program was integration where learners with VI were placed in the regular class to learn alongside the sighted peers. From the interview with education officer, 17 out of 20 schools which constituted the 85% of the learners, integrated in

regular schools near the learner's home with the other sighted peers. This was observed to be advantageous to the learners with VI in that it didn't segregate them from other peers and community thereby encouraging their learning process. The other programs i.e. special schools and inclusive programs were not found in the district, that was because the cost of putting up the schools was expensive and also the programs were being discouraged because they segregated the learners with VI from the other peers while the other program which was inclusive was a new approach and was yet to be implemented if the piloting project.

Upon the placement of learners with VI, in those programmes, the teacher provided them with different services ranging from consultancy, resource room teaching and itinerant teaching. To the questionnaires for teachers of Braille grade two, it showed that twelve teachers who were equivalent to 60% offered consultancy service, in consultancy service where there was a special education teacher, teaching with non-special education teachers. Apart from teaching Braille, the special education teachers took other lessons. The special education teachers interacted with non-special education teachers because they taught the same subject and were there only to be consulted whenever a problem arose. This large number of twelve teachers was because it was offered in integrated school which constituted the largest number in the district. It was observed that consultancy teachers interacted freely with non-special education teacher because they teach the same subjects and were the only to be consulted whenever a problem arose.

In the resource room teaching, six teachers who were equivalent to 30% offered that service, the number was low because there were only two schools with well-equipped resource rooms in the district. Sole task of those teachers was to teach special skills such as Braille to the learners with visual impairment. The merit of that program as observed, in the schools offering the service was that the learners with VI received special attention from Braille specialist and that they can easily access all the necessary learning equipments. However, that service segregates the learners with VI from the sighted peers which affected their performance.

The third service which was itinerant teaching service was offered by two teachers who constituted 10%. That service was where the special education teacher offered special education services in more than one school; that method was commonly used when there were few specialists such as Braille teachers necessitating them to move from one school to the other offering their special service. That service enabled the learner to get the necessary service from the specialists even if they did not have one in their schools. That service had shortcomings such as; the teacher needed to travel long distances which delayed the learning process, the service of the itinerant teachers was not easy because the teachers taught in different schools under different administration.

4.7 Summary of the Chapter

In conclusion, the data collected in the field when analysed revealed that the physical and social learning environment, the teacher factor, the way in which the learning media was determined, the assessment and placement of learners with VI had some effects on learning to read and write Braille. Also, it was revealed that poor adaptation of the curriculum, inadequacy of the educational resources and inadequate finance affected negatively the performance in Braille.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATION

This chapter, presents the summary, conclusion and recommendations based on the findings of the study. Suggestions for further research are also given.

5.1 Summary

In analysing the background to the problem, the researcher highlighted the number of the people with VI, worldwide and locally, who must learn using Braille as the medium of reading. The policy and legal framework of the education of a person with VI were discussed in details. In the statement of the problem, the researcher highlighted the issue of concern as to why some of the learners with VI continue to perform dismally despite the enormous efforts of the teachers, government and other stakeholders to improve on their performance. The purpose of the study explained why the study was being conducted. It also presented the research objectives, questions that were formulated, the justification, and the significance of the study. The constraints which the researcher encountered during the study and how he overcame them were discussed in details.

The researcher then discussed the theoretical framework which provided a guideline to the study based on skinner's theory of motivation and psycholinguistic theory of Smith and Goodman (1973). In the review of the related literature, the researcher reviewed published works by accredited scholars and researchers on braille reading and writing. The researcher critically examined the documents that provided direction on braille reading and writing effectiveness. In reviewing the related literature, the researcher tried to identify the clear gaps which had been addressed in the field. Then

the researcher developed themes related to the area of study using conceptual framework.

In chapter 3, the researcher discussed in details, the methodology used in the study for instance descriptive research design used in the study and its justification. Second, the various variables which included the independent and dependent variables were discussed. The study locale was discussed and supported by appendix 1 showing primary schools in Bomet District in Kenya.

In the sub-section, the researcher identified the target population of study sampling and sample size. The various research instruments such as questionnaire, interview, observation techniques and the researcher made braille test were elaborated. The methods of collecting the data in the field, through field survey techniques were explicitly expounded on. The research instruments developed were piloted at Bureti District in Kenya on a small scale. The procedure of collecting the data in the fieldwork clearly explained in different steps followed with the aim of checking on the conditions, availability and adequacy of learning resources. The data collected were analysed using the descriptive statistical method and qualitative statistical method and the results were derived from this analysis. Logistical and ethical issues were discussed at length. Chapter four discussed data analysis, presentation and interpretation.

Chapter five discussed in details the summary of the document, discussion, conclusion, recommendation and suggestion for further research.

5.2 Discussions

From the findings of the study, it was observed that learners with visual impairment performed poorly in Braille reading and writing because of the many challenges that affect their learning. These challenges include poor teaching methods, inadequate learning resources, frequent breakdown of Braille equipment, inadequate finance, unadapted curriculum, negative attitude towards learners with visual impairment and poor assessment and placement procedure. That implies that there was need to take measures in order to alleviate the situation so that the learners with visual impairment could learn effectively with minimal hindrance.

5.3 Conclusion

In conclusion, the result of the study revealed that performance of learners with VI in Braille was still low in integrated primary schools in Bomet district. That could be attributed to the many challenges they face in learning Braille. Those challenges range from unfavourable physical and social learning environment, the teachers' qualification, inadequate education resource and financial constrain. Therefore there was need to provide permanent solution to those challenges so as to improve on the reading and writing of Braille effectively.

5.4 Recommendations

The study revealed that the standard of learning Braille in Bomet District in Kenya was low and varies from one individual learner to the other. The recommendations below might help to improve the standard if implemented;

- i. The restrictions in the physical and social learning environment should be modified in order to remove restrictions on learners with VI by; re-arranging the classroom to enhance mobility, enlarging the learner's desks so as to accommodate the learning equipment. The parents, teachers, learners and the society at large should be sensitized regularly on the capabilities of learners with VI so as to change their attitude, beliefs and the cultural practices.
- ii. The teachers teaching Braille should be motivated by adjusting upwards their salary, reducing their workload, providing incentives so as to encourage them to teach Braille even more. The MoE in conjunction with NGOs should organize more seminars, short courses, to update teachers on the latest effective instructional strategies in the teaching of Braille.
- iii. There was need to improve on the assessment procedures interventions strategies and placement so that learners be placed according to their abilities and disabilities in relevant services. That would enhance performance improvement in Braille reading and writing
- iv. The Kenya Institute of Education should provide the necessary adapted curriculum to suit the individual needs of learner with VI. The KIE should also develop syllabus for teaching Braille to be followed by all the schools so as to ensure uniformity in the teaching of Braille in the country.
- v. The government of Kenya through the Ministry of Education should ensure that sufficient basic equipment and materials for learning Braille were available in all schools so as to ensure that all learners access the same Braille materials and equipment.

- vi. The government should also streamline the ways of funding the education of learners with VI so as to remove constraints such as irregular funding and dependency on donors.
- vii. The ministry of education should come up with a clear policy framework on the education of learners with VI instead of relying on policies laid down in the various Education Commissions.

That legal framework/policies should address assessment, placement and funding of the education of learners with VI.

5.5 Further Research

The study revealed that the following gaps still existed and there was need for a further research in the following areas:-

1. There is need to research on the challenges to effective integration of learners with visual impairment on regular schools on a large scale.
2. There is need to research on the performance of learners with visual impairment in local national exams such as the Kenya Certificate of Primary Education (KCPE) and the Kenya Certificate of Secondary Education (KCSE) as well as their performance in each examinable subject in the national exams.

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APPENDICES

APPENDIX A: MAP OF BOMET DISTRICT

APPENDIX B**Questionnaire for Head teacher****Instructions**

Please respond to this questionnaire honestly by ticking or filling in the black spaces appropriately. Your response will be treated with confidentiality and will only be used for research purposes. Don't write your name.

1. How many teachers in your school teach Braille?
 - a) Male _____
 - b) Female _____
 - c) Total _____
2. How many pupils in your school use Braille?
 - a) Boys _____
 - b) Girls _____
 - c) Total _____
3. Give the professional qualification of teacher(s) teaching braille in your school
 - a) Certificate in Special Education _____
 - b) Diploma in Special Education _____
 - c) Degree in Special Education _____
 - d) Other (specify) _____
4. What services do the teacher(s) of Braille give to pupils who read Braille in your school?
 - a) Consultative
 - b) Resource room
 - c) Itinerant
5. How often do the parents of the pupils give to pupils who read Braille in your school?
 - a) Always
 - b) Occasionally
 - c) Rarely

6. Is the regular school curriculum adapted to suit the needs of learners who read Braille?

a) Yes

b i) No, if no, what do you suggest should be done to meet their needs? _____

ii) If No in b(i) above _____

7. Who pays for the education of Braille learners in your school?

a) Government of Kenya

b) Parents

c) Sponsors

d) Others (specify) _____

APPENDIX C

Questionnaire for Braille Subject Teachers

Instructions

Please respond to this questionnaire honestly by ticking or filling in the black spaces appropriately. Your response will be treated with confidentiality and will only be used for research purposes. Don't write your name.

1. What is your professional qualification?
 - a) Degree in Special Education _____
 - b) Diploma in Special Education _____
 - c) Certificate in Special Education _____
 - d) Others (specify) _____

2. What service do you offer to Braille readers in your school
 - a) Consultancy
 - b) Resource room teaching
 - c) Itinerant teaching

3. Is there time allocated for teaching Braille and writing in the school timetable?
 - a) Yes
 - b) No – if No, how do you organize to teach Braille? _____

4. How many pupils do you teach Braille in your school?

Class 3 – 5 _____ Class 6 – 8 _____ Total _____

5. Which instructional strategy do you commonly apply when teaching Braille?
 - a) Based Reader Approach _____
 - b) Patters Approach _____
 - c) Whole Language Approach _____

- d) Language experience approach _____
- e) Literature based approach _____
- f) Others (specify) _____
6. How do you rate the reading and writing level of learners with visual impairment in your school?
- a) Very Good
- b) Good
- c) Average
- d) Below Average
7. In what way has integration of pupils with visual impairment affected the classes mean?
- a) Improved
- b) No change
- c) Reduced
8. What intervention measures has your school put in place to enhance the learning of Braille in your school? _____

9. Do you have enough Braille learning resources in your school?
- a) Yes
- b) No, If No, Specify _____
10. What is your school promotion policy for Braille learners to the next class?

11. Has the Braille learners in your school repeated any class ? YES/NO If yes, how many times?
a) None b) Once c) Twice d) Thrice
12. Give other challenges that you face when teaching Braille in your school

13. Do pupils with visual impairment have an extra space for storing piece of equipment? (YES/ NO). If no, where do they keep the equipment

14. What was the attitude of non special Education teachers towards Braille learners in your school at the inception of integration?

15. What is the current expectation of Braille pupils from non special Education teachers?
(i) Very High
(ii) High
(iii) Average
(iv) Low

APPENDIX D**Observation Checklist**

Learning Resources	Available	Condition	Adequacy	Other
	Yes /No	Good /Bad	Yes /No	Remarks
A. English Braille primer				
B. Braille writers				
C. Braille papers				
D. Slate and stylus				
E. Story books				
F. Class text books				
G. Sitting arrangements				
H. Size of desk				
I. Classroom arrangements				
J. Reading mechanics				
K. Teaching strategies				
L. Writing mechanics				

APPENDIX E**Research Made Test****SECTION A****Class three – five**

1. What do the following letters mean in Braille?
 - a) E
 - b) K
 - c) P
 - d) X
 - e) Z (5 marks)

2. Write the sign representing the following words in Braille
 - a) With
 - b) And
 - c) Of
 - d) The
 - e) For (5 marks)

3. Write the following words in Braille using the correct Braille contraction.
 - a) Stop
 - b) School
 - c) High
 - d) Bath
 - e) Dish
 - f) Candle
 - g) House

- h) Brown
- i) Bedroom
- j) Discuss
- k) Commit
- l) Succeeded
- m) Belief
- n) Rubber
- o) Conclude
- p) Added
- q) Bed
- r) Ladder
- s) Eggs
- t) Bread (50 marks)

SECTION B

Class six – eight

1. Write the following sentences using the correct Braille contraction
 - a) Candle
 - b) Star
 - c) King
 - d) End
 - e) Window
2. Youth will meet people from every part of the country (2mks)
3. You can go as soon as you like (2 mks)

4. The robbers were beaten to death after they were caught by the angered man
(2mks)
5. The head teacher of the school gave accommodation to the student (2 mks)
6. Ten remand prisoners broke out of police cell singing (2 mks)
7. I have just arrived from Nandi Hills (2 mks)
8. He got a pad and pencil and began helping the pupils add up his marks. (2mks)
9. They were sitting in a big room chatting, singing, clapping and listening to
music (2 mks)
10. Are you interested in minimum constitutional reforms? (2 mks)
11. The standard is a leading daily Newspaper in Kenya (2 mks)

SECTION C

Write the following passage using the correct Braille contraction

Nairoshi and Ewoton looked at each other. Their mother had just informed them that they would spend their holiday up-country.

“Think about it, Nairoshi,” said their mother. “You will now be able to get all your questions on cows answered!”

Ewoton could not help giggling. She recalled how they had woken up one day and found a herd of cattle near their house in the city. Nairoshi was so excited that he spent two hours talking to the herdsman. What are these herds of cattle doing in the

city? He had (30 marks)