

**ANALYSIS OF TEACHERS' PERCEPTIONS ON INSTRUCTION
OF BRAILLE LITERACY IN PRIMARY SCHOOLS FOR
LEARNERS WITH VISUAL IMPAIRMENT IN KENYA**

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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DEDICATION

I dedicate this dissertation to all children with visual impairment in Kenya.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES	vii
LIST OF FIGURES	ix
ACKNOWLEDGEMENTS	x
LIST OF ABBREVIATIONS	xi
ABSTRACT	xii
CHAPTER ONE: INTRODUCTION.....	xi
1.1 Introduction	1
1.2 Background to the Study.....	1
1.3 Statement of the Problem.....	11
1.4 Purpose of the Study	13
1.5 Objectives of the Study	13
1.6 Research Questions.....	14
1.7 Significance of the Study	15
1.8 Limitations and De-limitations of the Study	16
1.8.1 Limitations.....	16
1.8.2 De-limitations	17
1.9 Assumptions of the Study	17
1.10 Theoretical and Conceptual Framework	17
1.11 Operational Definition of Terms	22
CHAPTER TWO: LITERATURE REVIEW	24
2.1 Introduction	24
2.2 Factors Influencing Braille Literacy	24
2.3 Phonological Training and Reading Activities	27
2.4 Professional Preparation for Teaching Braille Literacy.....	35
2.5 Perceptions on Uncontracted and Contracted Braille	42
2.5.1 Hand Movements in Contracted and Uncontracted Braille	45
2.5.2 Reading Fluency and Spelling in Contracted and Uncontracted Braille	47

2.6 Print and Braille Literacy for the Low Vision.....	50
2.7 Perceptions on Teaching Literacy through Braille and Assistive Technology	54
2.8 Summary	59
CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY	61
3.1 Introduction	61
3.3 Variables	63
3.3.1 Independent Variables.....	64
3.3.2 Dependent Variable	64
3.4 Location of the Study.....	64
3.5 Target Population	66
3.6 Sampling Techniques and Sample Size	67
3.6.1 Sampling Techniques.....	67
3.7 Research Instruments	74
3.8 Pilot Study.....	76
3.8.1 Validity.....	78
3.8.2 Reliability	79
3.9 Data Collection Techniques	81
3.10 Data Analysis.....	82
3.11 Logistical and Ethical Considerations	84
CHAPTER FOUR: FINDINGS, INTERPRETATION AND DISCUSSION	86
4.1 Introduction.....	86
4.2 Demographic Information of the Teachers	87
4.3 Teachers' Perceptions on Factors Influencing Braille Literacy (Objective One) ...	86
4.4 Teachers' Perceptions on Phonological Training and Reading Activities for Young Children with Visual Impairment (Objective Two)	95
4.5 Perception of Teachers on their Professional Preparation (Objective Three)	107
4.5.1 Teachers' perceptions on their professional preparation in Braille literacy.....	109
4.5.2 Teachers' Opinion after Completion of Braille Literacy Training.....	110
4.6 Teachers' Perceptions on Teaching Contracted and Uncontracted English Braille Code in Schools for Learners with Visual Impairment (Objective Four)	115
4.7 Teachers' Perceptions on Provision of Print and Braille Literacy to	

Learners with Low Vision (Objective Five)	125
4.8 Teachers' Perceptions on the Use of Braille and Assistive Technology in Teaching Literacy Skills (Objective Six).....	133
4.9 Analysis of Teachers' Suggestions / Recommendations	138
4.10 Interview with Headteachers of Schools for Learners with Visual Impairment on the Situation of Braille Literacy in their Schools	141
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	164
5.1 Introduction	164
5.2 Summary of the Main Findings.....	164
5.3 Conclusions	169
5.4 Recommendations.....	171
REFERENCES	175
APPENDIX A: LETTER OF INTRODUCTION	187
APPENDIX B: RESEARCH QUESTIONNAIRE	188
APPENDIX C: INFORMED CONSENT FORM FOR TEACHERS	197
APPENDIX D: INTERVIEW GUIDE FOR HEADTEACHERS	198
APPENDIX E: INFORMED CONSENT FORM FOR THE HEADTEACHERS ...	200
APPENDIX F: RESEARCH AUTHORIZATION LETTER.....	201
APPENDIX G: RESEARCH AUTHORIZATION PERMIT	202
APPENDIX H: ANALYSIS OF TEACHERS' SUGGESTIONS / RECOMMENDATIONS.....	203

LIST OF TABLES

Table 3.1: The distribution of target population of headteachers and teachers	67
Table 3.2: Distribution of Sample Population	72
Table 4.1: Teachers' demographic information	88
Table 4.2: Teachers' perceptions on factors influencing Braille instruction	92
Table 4.3: Teachers' perceptions on the decline in Braille literacy	92
Table 4.4: Teachers' own feelings regarding factors influencing Braille teaching	93
Table 4.5: Teachers' perception on phonological training and reading for young Braille beginners.....	96
Table 4.6: Correlation matrix showing teachers' perception in relation to teachers' gender	98
Table 4.7: Correlation matrix showing teachers' perception in relation to teachers' Braille teaching experience	100
Table 4.8: Correlation matrix showing teachers' perceptions in relation to their age	Error! Bookmark
Table 4.9: Activities used by teachers to promote sound-letter and sound-word Association skills.....	104
Table 4.10: Teachers' perception on their professional preparation to teach Braille..	107
Table 4.11: Teachers' perception on their Braille proficiency	108
Table 4.12: Teachers' opinion on profession preparation on Braille literacy instruction	110
Table 4.13: Correlation matrix showing teachers' opinions on professional preparation for Braille literacy in relation to teachers' age	112
Table 4.14: Correlation matrix showing teachers' opinions on professional preparation in Braille literacy in relation to their experience	113
Table 4.15: Teachers' perception on teaching contracted and uncontracted English Braille code	116
Table 4.16: Correlation matrix showing teachers' perceptions on teaching contracted and uncontracted English Braille in relation to teacher's age.....	118

Table 4.17: Correlation matrix showing teachers' perception on teaching contracted and uncontracted English Braille in relation to teachers' Braille teaching experience	120
Table 4.18: Perceptions on provision of print and Braille literacy to learners with low vision.....	126
Table 4.19: Correlation matrix showing teachers' perceptions on provision of print and Braille in relation to the age of the teacher	129
Table 4.20: Correlation matrix showing teachers' perceptions on provision of print and Braille in relation to Braille teaching experience.....	131
Table 4.21: Teachers' perception on Braille and assistive technology	133
Table 4.21: Teachers' perception on Braille and assistive technology	133
Table 4.22: Correlation analysis showing teachers' perceptions on the use of Braille and assistive technology	134
Table 4.23: Correlation matrix on teachers' perceptions on the use of Braille and assistive technology in teaching literacy skills in relation to Braille teaching experience	135
Table 4.24: Teacher's suggestions on Braille training curriculum, students' characteristics on Braille learning for service delivery	139
Table 4.25: Demographic information on the Headteachers' respondents during the interview schedule	142

LIST OF FIGURES

Figure 1.1: Braille Alphabet..... 89

Figure 4.1: Teachers with disabilities..... 89

Figure 4.2: Nature of disability of the teachers..... 90

Figure 4.3: Number of years of teaching Braille..... 905

Figure 4.4: Teachers’ participation in professional programmes..... 109

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LIST OF ABBREVIATIONS

ECD	Early Childhood Development
KICD	Kenya Institute of Curriculum Development
KISE	Kenya Institute of Special Education
KNEC	Kenya National Examination Council
SNE	Special Needs Education
TSC	Teachers Service Commission
TTC	Teacher Training College
VI	Visually Impaired

ABSTRACT

The purpose of the study was to investigate and analyze teachers' perceptions on instruction of Braille literacy in special primary schools for learners with visual impairment in Kenya. To address the problem of decline in Braille literacy as a result of teachers' reluctance to learn and teach Braille in these schools, seven objectives were formulated to determine and establish teachers' perceptions on the Braille Code, and factors influencing instruction of Braille in schools, as well as establishing their professional preparation, dual media for learners with low vision and the relationship between Braille and technology. The study targeted five (5) primary schools which had learners with visual impairment in the country and the target group comprised 132 teachers teaching in the five primary schools and five headteachers. The research adopted the descriptive survey research design and was based on Bruner's perceptual model which explains the process of perceptual development. Multiple sampling techniques were applied to select the five schools and respondents. Out of fifty-eight (58) respondents, fifty-three (53) were teachers while five (5) were headteachers. A questionnaire focusing on the objectives of the study was used to collect data from the teachers. An interview schedule was used to collect data from the headteachers. Pilot testing of the teachers' instrument yielded a reliability of 0.842 while teachers' questionnaire was reviewed by experts to enhance validity. Quantitative data was analyzed using descriptive statistics namely: frequencies and percentages. The statistics were generated by means of the Statistical Package for Social Sciences (SPSS) version 22.0, while qualitative data was analyzed through narrative analysis and thematic approach. The findings revealed that Braille literacy skills have declined in special primary schools for learners with visual impairment and that factors perceived by teachers as causes of this decline in Braille standards include: increase in multiple disability population, pupil-teacher ratio, inadequate teacher preparation and teacher incompetence. The findings also indicated that teachers were not specially trained in Early Childhood Education (ECD) for learners with visual impairment. The study findings further revealed that nearly two-thirds of the teachers believed that children who use contracted Braille are better spellers and faster readers than children who read English Braille grade 1. Moreover, the research established that schools for learners with visual impairment do not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print, with a mean of 2.21. Finally, findings revealed that nearly three quarters of the respondents indicated that technological devices should be used to enhance Braille, not to replace it, with a mean response of 1.25. On the basis of these findings, the study recommends that policy-makers through the Teachers Service Commission should adequately support the ECD programmes for learners with visual impairment with specially trained teachers. The Ministry of Education should also facilitate Special Needs Education teachers to attend Braille refresher courses, seminars and workshops on a regular basis. The Ministry should also make a deliberate effort to increase funds to the schools for learners with visual impairment.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter outlines the following sections: background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, limitations and de-limitations of the study. Other sections discussed in this chapter are: assumptions, theoretical framework, conceptual framework and operational definition of terms.

1.2 Background to the Study

All over the world, the essence of excellent literacy skills for all individuals is demonstrated by the value placed on reading and writing in schools and in the society as a whole. In fact, literacy skills can rightly be considered as the cornerstone of education. Achievement in all academic subjects such as mathematics, science and social studies is impossible without reading and writing skills and the ability to gather, use and convey information.

Literate individuals can excel in school and enter adulthood with a competitive advantage in employment and in life, which is not the case for individuals with low or no literacy skills. For people with visual impairment, literacy skills are equally significant. Although the manner in which learners with visual impairment acquire and develop these skills may vary, the goal is the same: to use reading, writing and other literacy tools to obtain and understand important information for their own benefit and that of others (Spungin, 2012).

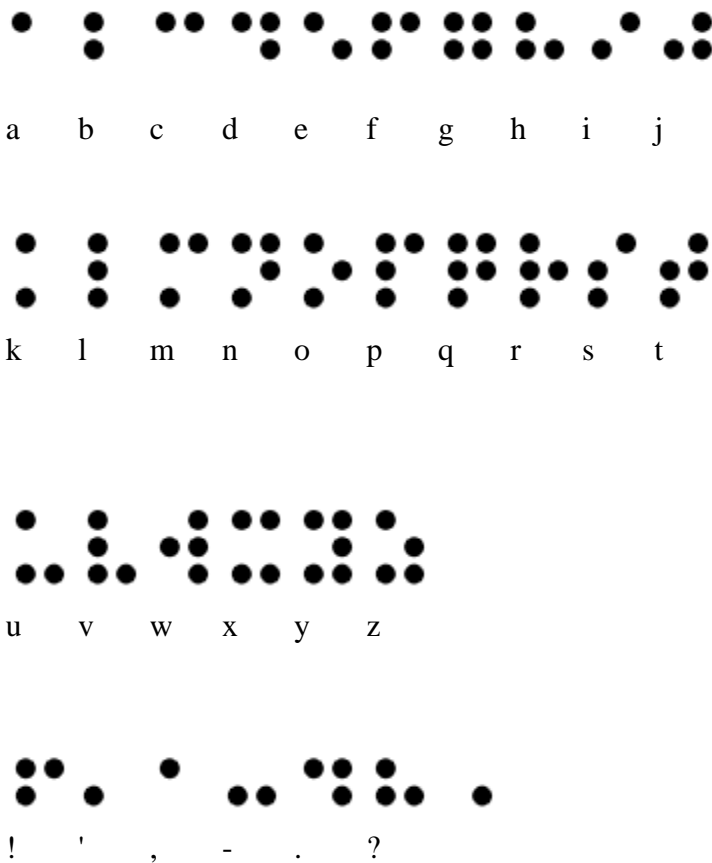
The history of education for students with visual impairment is relatively short but impressive. For almost two centuries, people who are blind have benefited from Braille as a communication skill in various aspects of life. Students and professionals with visual impairment alike unequivocally acknowledge and testify to the impact that Braille literacy has had on their academic, social and economic life. Indeed, the indispensability of Braille is only comparable to orientation and mobility, social living skills and activities of daily living for children, youth and adults with visual impairment.

Invented in 1829, Braille is a tactile code that replaces printed characters with simplified patterns of raised dots adapted to the tactile sensitivity of the fingertip. Each Braille cell is formed of a 2 by 3 matrix of dots that encodes a character or group of characters. Today, Braille proficiency has notably been associated with higher employment rates and educational levels, self-sufficiency, independence, self-esteem and feelings of competence. In schools for learners with visual impairment in Kenya and indeed in English-speaking countries, children learn Grade One and Two Braille. "Grade One Braille" is Uncontracted Braille while "Grade Two Braille" is Contracted Braille. Grade One Braille is similar to print in the sense that Braille alphabet is put together to create words.

However, using grade One Braille not only takes a lot of time to read, but also uses up a lot of space on the page. On the other hand, contracted Braille is made up of short form words making it convenient as it saves a lot of space. The abbreviations allow the Braille- user to read with better fluency.

Many teachers think that their Braille-reading students should learn grade one Braille before learning grade two contracted Braille. However, all Braille-reading students need to learn their alphabet although some skip the grade one Braille and start learning to form words using contracted Braille. Most of the Braille contractions are also sight words, such as but, can, do, every, from and many more.

Figure 1.1: Braille Alphabet



Thus, young children with visual impairment learn to read Braille as sighted children learn to read print. Both learn the meanings of symbolic representations (print and Braille characters) and the manner in which those representations form words, sentences and paragraphs which when put together communicate a message.

Several teaching methods that work for sighted children may also work for children with visual impairment, but generally, a number of modifications are required for use with children with visual impairment. Choosing the strategy or combination of ways that most accurately fits the student's desires is critical for the student's success in learning to read (Holbrook & Nannen, 1997).

According to World Health Organization (2009), there are an estimated 9 million people who are blind in sub-Saharan Africa and a further 27 million people who have low vision. This represents 18.4% of the world's people who are blind despite the region having only 11% of global population and the highest regional burden of blindness ratio in the world.

The census statistics of 2009 indicated that the population of people with disabilities in Kenya was about 1.3 million; 25% of whom were people with visual impairment (Republic of Kenya, 2009). It is estimated that there were approximately 15,500 children with visual impairment in Kenya, 21% of whom are attending school (MOE, 2009). To date, there are 1,283 pupils in six primary schools for learners with visual impairment and many integrated units spread throughout the country (MOE, 2014). Recently, four small secondary schools for learners with visual impairment have been established in addition to Thika High School for the Blind which was started in 1967. The medium of literacy in these schools is Braille for learners who are blind or large print for learners with low vision.

Ndung'u (2011) argues that, Braille will always be more than a medium of literacy for persons with visual impairment. It seeks to represent competence, independence and equality. Since its invention as a communication skill, Braille codes have been developed for many languages, covering a range of subject areas such as mathematics, music, computing, science, chess and knitting patterns. Braille is also incorporated into products such as clocks, watches and timers, games and maps. It is the primary tool for literacy available to people who are blind, deafblind, or who have severe vision impairment.

No other medium is able to convey the core elements of literacy such as spelling, punctuation, grammar and syntax necessary for writing and for full comprehension when reading. Though it is obvious that literacy is a key factor in determining success in life, including employment, it would appear that Braille literacy has declined dramatically in the past few decades and is now at a critically low level worldwide. Yet in spite of all this, Braille will remain relevant so long as print is relevant and is unlikely to be replaced by other technologies for the foreseeable future, since it is a foundational skill for literacy, numeracy and information access for people who are blind (Vision Australia, July, 2011). Bearing in mind that the social life and academic progress of people with visual impairment are dependent on Braille literacy, it is not surprising that there is a growing awareness about the decline in Braille reading, as well as in Braille writing. Recent surveys have also shown that Braille readership has significantly declined among students, as well as the general population (Gray & Wilkins, 2005 & McCall, 1997).

A number of researchers point out that the excessive usage of assistive technology may serve people with severe visual impairment tremendously, but on the other hand, the cultivation of literacy skills may be delayed significantly (Argyropoulos, 2005&Spungin, 1996). At present, research seems to confirm that the issue of Braille usage or Braille illiteracy is more complex and should be investigated within the larger context of all the concerns in the field of blindness (Layton, 2000; Amato, 2002). Research has shown that there has been a growing concern throughout the English-speaking countries over a perceived decline in Braille literacy skills (Australian Braille Authority, 1999; Rex, Koenig, Wormsley, & Baker, 1994; Allman &Holbrook, 1999).

In Canada, the “BrailleLiteracy Canada (BLC)” is concerned with the Braille literacy decline in the country and is actively involved in promotion of Braille. It supports the development of Braille as the primary medium of literacy for persons with visual impairment in Canada. Three vital goals that Braille literacy Canada seeks to achieve are:-

1. Encouraging and participating in research related to all aspects of Braille;
2. Establishing, adopting and monitoring standards for the production and teaching of both English and French Braille; and
3. Encouraging the use of Braille in the home, school and general community (<http://www.Braille literacycanada.ca/home>).

In East Africa, decline in Braille literacy has been noted. As a result, the Kilimanjaro Blind Trust has invested in projects aimed at equipping children who are blind or visually impaired with knowledge, skills and attitudes for independent and fruitful life. They focus on increasing educational opportunities for learners with visual impairment by supporting Braille literacy programmes operated by Perkins in Tanzania, Uganda and Kenya. This partnership reaches thousands of children through:-

- ❖ Teaching Braille literacy;
- ❖ Distributing new Perkins Braille writers, pencils and papers for people who are blind;
- ❖ Training teachers to work with students who are blind; and
- ❖ Offering Braille writer repair workshops and spare parts to repair Perkins Braille writers.

Together, the Kilimanjaro Blind Trust and Perkins are creating a new day for children who are blind or visually impaired in East Africa. All this is done in collaboration with the governments in the respective countries

(<http://www.perkins.org/international/kilimanjaro-blind-trust>).

In Kenya, both in the education sector and the adult Braille reading community, there is an increasing concern about the decline in the usage of Braille. Consequently, the need to address the falling standards of Braille literacy, particularly in schools for learners with visual impairment was of utmost importance, making an analysis of teachers' perceptions on teaching literacy through Braille a logical starting point.

Thus, the main question that the present study sought to answer was: what are the teachers' perceived opinions about Braille literacy instruction of learners with visual impairment in Kenya? This issue deserved urgent attention since research studies have not yet been conducted to fill this knowledge gap.

Limited literature is available in the research database about Braille teaching issues and teachers' perspectives on Braille literacy instruction. In particular, for the last ten years, researchers in Kenya have concentrated on issues revolving around inclusive education and case-studies on Braille in various special schools for learners with visual impairment. The deficiency of research on Braille literacy in Kenya may be the result of many factors, but not due to the insignificance of this study. Individuals with visual impairment in Kenya face a similar "Braille Literacy Crisis" as do their counterparts in various countries where Braille literacy decrease has been reported (National Federation for the Blind, 2009).

As a matter of fact, researchers and educators have debated over the teaching of Braille literacy through the medium of Braille for many years. Nonetheless, the extent to which evidence from psychological and educational research has reached teachers and improved their practice remains to be established (Steve, Mike & Graeme, 2011).

Some UK studies recommend variation in methods of teaching Braille literacy, particularly in the timing of the introduction of contractions, as will be discussed in the next chapter.

There is also a wealth of information and resources on developing Children's Braille reading skills, but there has been little research into the efficacy of these approaches and teachers' perspectives about Braille literacy (Steve, *et al.*, 2011).

The present study was therefore conceptualized to analyze teachers' perceptions on six key Braille literacy issues including: phonological training and reading activities for young children with visual impairment, professional preparation, factors influencing Braille literacy, contracted and uncontracted Braille, Braille and print literacy for learners with low vision (dual media) and relationship between Braille and technology. Since learners who are blind achieve their literacy through Braille, knowledge of what teachers think and feel about Braille literacy in schools for learners with visual impairment is of paramount importance in addressing concerns about the decline in Braille in Kenya and beyond.

As Nemeth (1988) observed, Braille makes it possible for a blind person to assume a role of equality in modern society, as it seeks to unlock the potential within an individual making him or her become a contributing member of one's community. Nemeth points out that Braille literacy as an integrated view of literacy not only encompasses the conventional notions of reading, writing, speaking and listening, but also greatly develops these abilities to integrate meaningfully with life skills.

1.3 Statement of the Problem

In an effort to understand the research knowledge represented in different ways, more studies have recently been conducted in descriptive qualitative approaches to

recognize teachers' thoughts regarding Braille and Braille instruction, none of which has been conducted in Kenya. Despite their training as specialist teachers for students with visual impairment, many teachers in primary schools for learners with visual impairment are reluctant to learn and teach Braille as a result of which they are now soliciting assistance from their blind colleagues and students to read for them Brailled class assignments and examinations. Consequently, students have taken advantage of this reluctance of their teachers and have resulted in writing unconventional Braille, where they are now using their own Braille contractions contrary to accepted Braille rules and standards of Universal English Braille Code. This state of affairs poses a big challenge to the development of Braille literacy instruction in primary schools for learners with visual impairment in Kenya. Unless this worrying and dangerous trend receives urgent attention, the usage of the Braille code as the source of empowerment for learners who are blind will be seriously compromised.

Nzoka (2011) investigated proficiency of primary school teachers in English and Kiswahili Braille literacy, targeting teachers in special schools for the blind and integrated programmes in Kenya. The study revealed that, teachers were not interested in learning Braille and demonstrated lack of Braille skills in guiding their learners. This is a clear indication of decline of Braille literacy in special primary schools.

Another study conducted in the USA, Wittenstein (1994) established that consumer groups have placed blame on the decline of Braille literacy on teachers' negative attitudes towards Braille and lack of proficiency in Braille.

The researcher, himself visually impaired and a consumer of Braille, felt that necessary intervention measures could be taken once a systematic investigation of teachers' perceptions towards Braille literacy is conducted and clearly documented, hence the essence of the current study to fill this knowledge gap. Knowing teachers' views and feelings about the status of Braille literacy instruction in schools for learners with visual impairment is likely to enhance the quality of literacy through Braille and promise higher prospects for persons with visual impairment.

1.4 Purpose of the Study

The purpose of the study was to investigate and analyze teachers' perceptions on instruction of Braille literacy in special primary schools for learners with visual impairment in Kenya.

1.5 Objectives of the Study

The following objectives were formulated for the study:

1. To determine teachers' perceptions on factors influencing Braille literacy in schools for learners with visual impairment in Kenya;
2. To determine teachers' perceptions on phonological training and reading activities for young Braille learners in Kenya;
3. To examine teachers' perceptions on their professional preparation in Braille literacy instruction in Kenya;
4. To establish teachers' perceptions on teaching contracted and uncontracted English Braille code in schools for learners with visual impairment in Kenya;

5. To determine teachers' perceptions on provision of print and Braille literacy for learners with low vision in Kenya;
6. To find out teachers' perceptions on the use of Braille and assistive technology in teaching literacy skills to learners with visual impairment in Kenya;
7. To find out views and feelings of headteachers of schools for learners with visual impairment on the situation of Braille literacy instruction in their respective schools.

1.6 Research Questions

1. What views do teachers hold about factors influencing Braille literacy instruction in schools for learners with visual impairment?
2. What are the teachers' perceptions on phonological training and reading activities for young Braille beginners?
3. What are teachers' perceptions on their professional preparation for teaching literacy through Braille?
4. What are teachers' perceptions on teaching contracted and uncontracted English Braille code in schools for learners with visual impairment?
5. What do teachers think regarding teaching of both Braille and print to students with low vision in schools for learners with visual impairment?
6. What are the teachers' perceptions on the use of Braille and assistive technology in instruction of literacy skills to learners with visual impairment?
7. What is the perception of headteachers of primary schools for learners with visual impairment on the situation of Braille literacy instruction in their schools?

1.7 Significance of the Study

Braille literacy is critical to the success of learners with visual impairment. It is for this reason that the present study was conceptualized to analyze and establish teachers' perceptions on Braille literacy in primary schools for learners with visual impairment in Kenya. This was the first time this kind of study was being conducted. With teachers being viewed as the primary agents in the education of learners with visual impairment, their perceptions towards Braille must be borne in mind.

The study was undertaken at a time when there was a lot of concern being expressed about "Braille literacy crisis" in both developed and developing countries. This meant that Braille standards were declining for reasons that had not yet been established, hence the importance of this study. The universities, education ministries, school headteachers, education officers and other administrative and supervisory personnel may virtually benefit from this study. The survey was intended to make a significant and valuable contribution to knowledge and understanding particularly in the following areas:

- ❖ Factors influencing teachers' perceptions and attitudes towards Braille literacy.
- ❖ The preparation and training of specialist teachers for learners with visual impairment.
- ❖ Establishment of immediate and long-range goals for the improvement of Braille literacy.

- ❖ The organization of short in-service courses and seminars on Braille literacy for headteachers and other educational personnel.

The survey instrument used, the findings and the conclusion of the study may help provide information and basis required in the formulation of policies related to the delivery system of education for learners with visual impairment. The results may assist school system administrators with ways to provide strategies to ensure that teachers develop positive perceptions on instruction of Braille literacy. When teachers' perceptions towards seven key Braille literacy issues identified for the present study are addressed, students with visual impairment will stand to gain as their education will not be compromised.

1.8 Limitations and De-limitations of the Study

1.8.1 Limitations

The following limitations were considered in interpreting the results of the study. The research instruments developed for the study were confined to questionnaires and interview schedules and therefore subject to the difficulties inherent in this type of instruments. The confidence which could be placed in the perceptions of those teachers who responded to questionnaire and interview schedules and the reliability of the questionnaire itself are not above question. Additionally, the generalizability of the survey results was limited to the target group since teachers of learners with visual impairment in integrated units and inclusive settings did not participate in the survey.

1.8.2 De-limitations

The present study did not investigate perceptions of teachers towards Braille literacy in integrated units for learners with visual impairment due to lack of logistical support to carry out a study of this magnitude. Parents' perceived opinions about Braille literacy of their children in schools for learners with visual impairment were not determined in the present study.

1.9 Assumptions of the Study

This study was conducted under the following assumptions:

1. Participants were Braille literate in both Grade 1 and Grade 2 English Braille.
2. Participants were teaching or had taught Braille or print to learners with visual impairment.
3. The participants would give honest responses and volunteer to participate during the data collection.
4. Participants were specially trained to teach learners with visual impairment.

1.10 Theoretical and Conceptual Framework

1.10.1 Theoretical Framework

The study was based on Bruner's model of perception. According to Bruner (1958), people go through the following process to form perceptions or opinions: In the first place, when we come across an unfamiliar target, we are presented with different informational cues and want to learn more about the target. Secondly, we try to gather more information about the target. Gradually, we encounter some familiar cues which help us categorize the target.

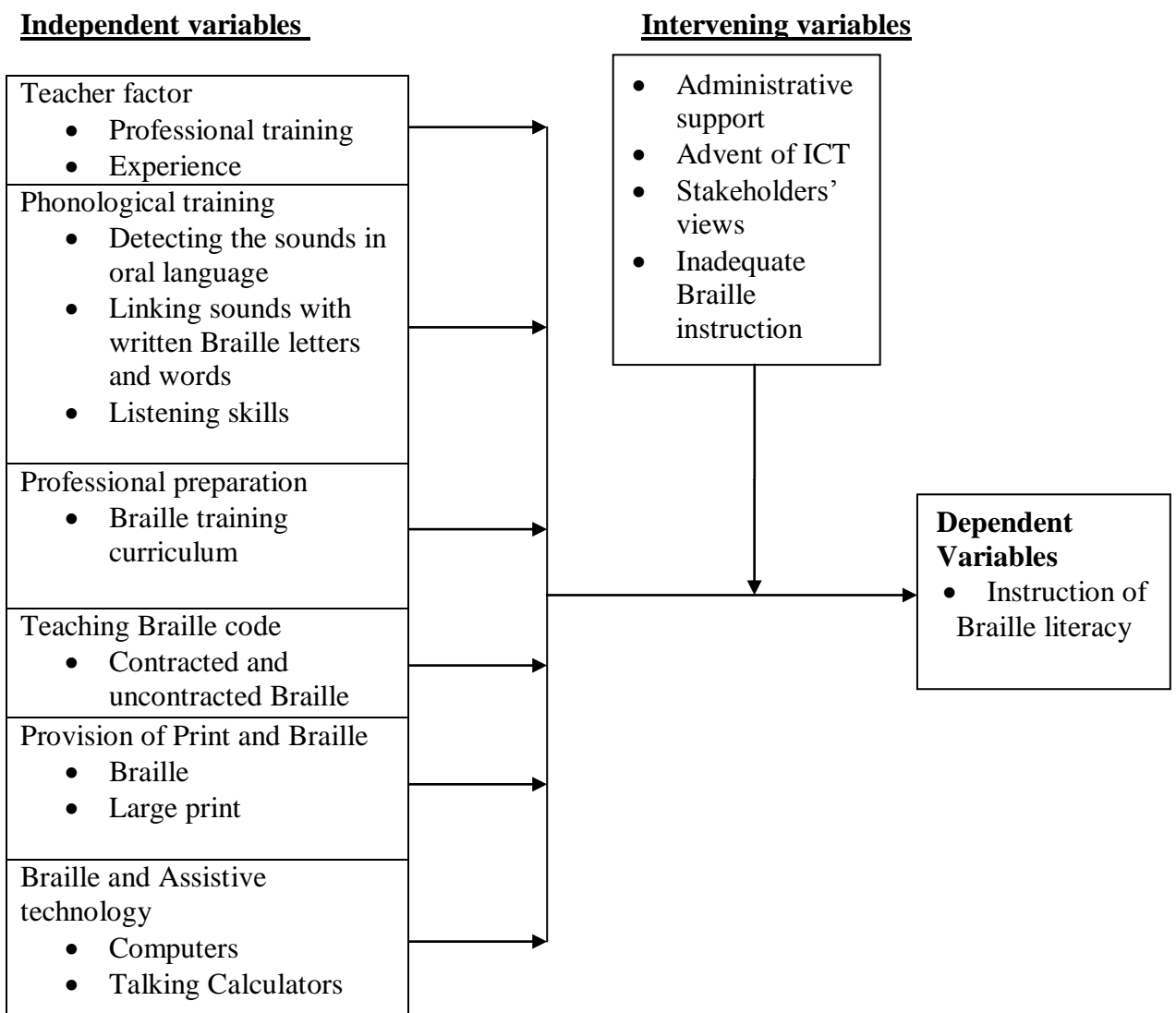
At this stage, Bruner points out that the cues become less open and selective. In the process of trying to search for more cues that confirm the categorization of the target, we ignore the cues that violate our initial perceptions. As our perception becomes more selective, we finally paint a consistent picture of the target. In their interpretation of the above model, Sacks & Johns (1993) identified three components of perception:

1. The perceiver– This is a person who becomes aware about something and comes to a final understanding of it. His or her perceptions can be influenced by three factors: motivational state, experience and finally emotional state. In different emotional or motivational states the perceiver will react to or perceive something in different ways. Besides, in different situations he or she might employ a “perceptual defense” where they tend to “see what they want to see”.
2. The target - This is the object or the person who is being perceived or judged.
3. The situation also greatly influences perceptions because different situations may call for additional information about the target.

Bruner’s perceptual model was adopted for the present study because “perception involves interpreting the messages of our senses to provide a personal understanding and meaning to the environment”. As perceivers, teachers begin to form their perception towards Braille once it is introduced to them in college. It is at this time that Braille becomes an unfamiliar target. During the training process, their perception on Braille becomes more selective, as a result of which they paint a consistent picture

of Braille literacy. In school however, their perception will be influenced by their personal experiences, emotions, motives and basic understanding of the Braille Code. The availability of teaching/learning Braille materials, facilities in schools for learners with visual impairment and technological advancements may also influence teachers' perceptions on instruction of Braille literacy.

1.10.2 Conceptual Framework



From the diagram presented above, teachers' perceptions can either be positive or negative. Independent variables on positive perceptions may also include: adequate training in Braille as a communication skill, Braille code comprehension (easy to understand) and teachers' ability to develop own instructional methods and to facilitate learning.

On the other hand, negative perceptions may imply inadequate training in Braille as a communication skill, Braille code complexity (difficult to understand), inability of the teacher to develop his/her own instructional methods and inability to facilitate learning.

The outcome of positive perception is teachers' Braille proficiency, while the outcome of negative perception could be decline in Braille literacy. All this leads to the dependent variable which is instruction of Braille literacy. There are other intervening variables that could also influence teachers' perceptions towards Braille such as: administrative support, advent of ICT, inadequate Braille instruction time and early discontinuation of Braille instruction in schools for learners with visual impairment.

1.11 Operational Definition of Terms

Braille literacy: Ability to read, write and communicate in Braille.

Contracted Braille: It is often referred to as ‘Grade 2’ Braille and involves the use of the traditional alphabet, along with 189 different signs and contractions that represent groups of letters or whole words (Steve *et al.*, 2011).

CVC Words: Consonant-Vowel-Consonant (CVC) words such as ‘mum’, ‘hat’.

Grapheme: A written symbol, letter, or combination of letters that represents a single sound. Most commonly, a letter of the alphabet e.g. ‘f’ although it can also refer to the combinations of letters that can make the same sound as the letter e.g. ‘ph’ for (photograph) or ‘gh’ (cough) (Steve *et al.*, 2011).

Morpheme: An individual unit of meaning in a word. For example, the word unbreakable may be analyzed as consisting of three morphemes: un, break, and able.

Nemeth Code: A special type of Braille used for mathematics and science notations. Nemeth code is the accepted standard code for representing mathematics and science expressions in Braille.

Perception: A particular way of understanding or thinking about something; the ability to understand and make good judgment about something; a personal opinion or belief about a particular situation or subject. In this study, the terms perception, view and opinion will be used interchangeably.

Phoneme: The smallest unit of speech distinguishing one word (or word element) from another (e.g., the sound /p/ in ‘tap’, which differentiates that word from ‘tab’ and ‘tag’). (Steve *et al.*, 2011).

Phonics: A method of teaching beginners to read and pronounce words by learning to associate letters or letter groups with the sounds they represent (Steve *et al.*, 2011).

Phonological awareness: The ability to detect, manipulate and analyze the sounds in oral language, including the ability to distinguish, segment and blend syllables, rhymes and phonemes (NELP, 2008).

Students with low vision: Students who use residual vision in print reading and writing.

Uncontracted Braille: Uncontracted Braille, often referred to as ‘Grade 1’ or ‘alphabetic’ Braille, uses no contractions and maintains a letter-for-letter correspondence with print. (Steve *et al.*, 2011).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is presented and discussed under the following sections: perceptions on factors influencing Braille literacy instruction, teachers' perceptions on phonological training and reading activities for young children with visual impairment, perceptions on professional preparation and Braille training curriculum, perceptions on teaching contracted and uncontracted Braille, perceptions on Braille and print literacy for learners with low vision (dual media) and perceptions on teaching literacy through Braille and assistive technology.

2.2 Factors Influencing Braille Literacy

According to Mwangi (2009) learners who are blind would benefit more if they would actively participate in Braille learning process; a possibility that would be realized if they are provided with Braille learning materials. However, there are fewer materials for the Braille readers than for print readers. Lack of Braille materials significantly affects the Braille readers in academic achievement as compared to print readers. Mwangi observes that in Kenya, Braille equipment is not only imported but also sold at exorbitant prices. Besides, the cost of Braille production is high, thus making it an obstacle to enhancement of education for the blind. This lack of materials is a great hindrance to effective Braille teaching and learning in schools for learners with visual impairment. She further contends that slates and styluses are used by most learners, whereas Braille machines are better than the former.

However, due to their limited number, only class seven and eight pupils have access to them. She further observes that learners lack necessary Braille textbooks while teachers share the Braille primer. This compels the learners to solely depend on the teacher for all Braille instruction, mainly conveyed through dictation.

Njue (2009) supports this view arguing that regardless of the type of reading materials, a child with visual impairment must have all books and reading materials necessary to learn Braille as well as basal readers, literature anthologies or novels. The National Federation of the Blind (NFB) (2009) identified five factors attributed to the low Braille literacy in the United States of America. They are:

- Shortage of teachers who are qualified to teach Braille.
- Misconceptions about the Braille system, for example, “reading Braille isolates and stigmatizes students from peers who read print,” or “Braille is always slower than reading print and difficult to learn” (NFB, 2009). However, studies have found that Braille is an efficient and effective reading medium with students demonstrating a reading speed exceeding 200 words per minute (NFB, 2009).
- Insistence on teaching print reading to a majority of children with Low Vision who could benefit from Braille literacy.
- Replacement of Braille with technology: Most teachers agree that technology should be used as a supplement to Braille rather than a replacement.
- Technology advancements have made Braille more available than ever before (NFB, 2009).

On the other hand, NFB (2009) asserts that the key to success for the blind is the ability to read and write Braille competently and efficiently. In this context, NFB believes that Braille literacy can be improved by:-

- ✓ Researching on new methods of teaching and learning Braille.
- ✓ Increasing access to Braille instruction and reading materials in every community nationwide.
- ✓ Putting a requirement on national certification in literary Braille among all special education teachers.
- ✓ Advancing the use of Braille in current and emerging technologies.
- ✓ Making Braille resources more available through online sharing of materials, enhanced production methods and improved distribution
- ✓ Requiring all Braille teachers to pass the National Certification in Literary Braille in order to assure their competency and fluency in the literary code.
- ✓ Expanding Braille mentoring, reading-readiness and outreach programmes.

Consumer groups in USA have placed partial blame for the decline of Braille literacy on teachers' poor attitudes towards Braille and lack of proficiency in Braille (Wittenstein, 1994). According to Mwangi (2009) Braille teachers must of necessity know all the symbols and rules on Braille code as these determine the quality of Braille reading and writing.

However, most of the employed teachers have limited knowledge and skills in Braille while some demonstrate negative attitude towards Braille itself. It is the duty of the teacher to encourage the learners to have positive attitude towards

learning Braille literacy and to demonstrate instances when Braille may be used in everyday living in addition to looking for interesting Braille books (Njue, 2009).

Ndung'u (2011) advances the view that increasing use of technology for access to print for both learners with low vision and those who are blind affects the attitude towards Braille use. This claim warrants further research. On the other hand, Mwangi (2009) maintains that it is logical for one to demonstrate lack of interest in an area of deficiency. If more training and more emphasis is put on the qualification of teachers in Braille, then, their confidence and self-worth would be boosted, hence improving the teachers' attitude positively. Quality Braille literacy does not only depend on teacher's positive attitude but also on teacher's education, availability of support materials, teacher-pupil ratio and workload. In view of the literature reviewed in this section, the present study sought to determine what teachers considered as critical factors influencing the teaching of literacy through Braille in schools for learners with visual impairment in Kenya. Since an analysis of teachers' perceptions on factors influencing instruction of Braille literacy in special primary schools had not been conducted and documented, the present study filled this gap.

2.3 Phonological Training and Reading Activities

There is general support for the view that reading in Braille has much in common with reading through print. However, limited possibilities to experience incidental learning affect the reading pattern followed by children with visual impairment prior to formal education (Edmonds & Pring, 2006). For instance, in their study Emerson, Holbrook and D'Andrea, (2009 p611), reported that beginning Braille readers in the

USA did not demonstrate Braille tactile proficiency skills that enable visually impaired learners to read fluently as is the case with young print readers. A study conducted by Monson and Bowen (2008) on the development of phonological awareness by Braille readers found that, the relationship between Braille and phonological awareness was not certain due to the following: lack of similarity among the studies, the extent of conflicting findings, the limited number of studies involving beginning Braille readers and the absence of common characteristics among the studies. The conflicting findings are particularly obvious in relation to children between seven and twelve years.

In another study, Greaney and Reason (1999) used a sample of Braille readers ranging between seven to twelve years to assess their phonological performance. The study revealed that the scores obtained for each test on phonological awareness were higher than those expected from the norms of their sighted peers. In spite of this linguistic advantage, the Braille readers did not read as well as sighted children. The study concluded that children with visual impairment found it extremely difficult to progress from phonological to orthographic awareness.

Similarly, another study by Gillon and Young (2002) compared the linguistic development skills of nineteen New Zealand children aged seven to fifteen years who were using Braille as their reading medium, with those of a control group of sighted children who were three years younger but of the same reading age. They found that children who had problems reading Braille also delayed in their development of linguistic awareness, demonstrating strengths and weaknesses that were similar to

those of the younger sighted children.

Moreover, a study by Dodd and Conn (2000) in the UK required children with visual impairment to identify contracted and uncontracted words according to their sounds. They established that Brailleists performed below the level of sighted children on reading tests and were relatively poor on linguistic awareness skills in comparison with a matched group of sighted children. In particular, they found that ‘the participants who were blind scored lower on separating words that contained Braille contractions, concluding that, “the fact that contracted Braille symbols such as ‘the’ in the word ‘further’ can cut across phonological boundaries” affects a reader’s ability to segment words phonemically and that some phonological problems may be as a result of ‘the nature of contractions in Braille orthography’ (p. 9).

As far as young pre-school children are concerned, Barlow-Brown and Connelly (2002) noted that children who are born blind do not receive exposure to environmental print and therefore do not generally learn to recognize written letters of the alphabet until they join school where they learn Braille.’ (p. 259).

On the contrary, Treiman and Rodriguez (1999) found that most fully sighted children are able to recognize approximately 15 print letters before they begin school. In addition, Barlow-Brown and Connelly found that children with visual impairment ‘with no knowledge of written letters or written words showed no ability at measures of phonological awareness’ whereas ‘children with visual impairment with knowledge of written letters and no written words showed much increased phonological awareness’ (p. 259).

The authors observed that letter learning is a major contributor to the development of linguistic skills in children who are blind, and that these critical skills develop only after children who are blind experience a written form of language. They argued that ‘learning to recognize Braille letters provides the impetus for improvements in phonological awareness’ (p. 267). Finally, they concluded that, whereas for sighted children knowledge of letter names goes hand-in-hand with knowing what the letter name refers to, ‘until children with visual impairment learn Braille letters they can’t make this connection and the development of phonic awareness is stifled as a consequence (p. 267).

In a survey of early literacy practices of 192 specialists visiting teachers of pupils with visual impairment working with preschool children in the USA, Murphy, Hatton and Erickson (2008, p. 136) investigated strategies for promoting phonological awareness used by teachers. These included: “singing and listening to songs, nursery rhymes and chants; reading stories with interesting sounds/rhythms; building knowledge of sound-symbol associations in meaningful contexts; inventing words that rhyme with child’s name; playing with sounds in words (e.g. tongue twisters, nonsense rhymes); playing word games with children to identify beginning sounds in words; pointing out particular sounds in words when reading a storybook; emphasizing the number of syllables or phonemes in spoken words” (p140). The study found that almost all teachers did not use direct structured instruction to develop phonological awareness, for instance, pointing out particular sounds in words or emphasizing the number of syllables or phonemes in spoken words. They were also not implementing

recommended practices in early literacy such as encouraging phonological awareness and the function of writing. The authors suggested that this may be due to lack of access to current resources on teaching literacy. They concluded that there was a need for the development of resources that address linguistic development skills.

According to Steve, Mike and Graeme (2011) teachers should focus on the development of activities with children who are visually impaired to promote their linguistic and Braille literacy development at an early age. Children who are blind need to be exposed to activities that encourage them to manipulate, detect and analyze the sounds in oral language and more importantly to activities that are intended to help them make the link between these sounds and written Braille letters and words. They stressed that, as children progress, phonological instruction needs to continue with particular emphasis and attention given to the development of higher level linguistic skills and their application to Braille text.

They further pointed out that a critical stage in the development of linguistic skills occurs before the child starts formal schooling and that although there is some evidence that children with visual impairment may have an early linguistic advantage over sighted children due to their increased dependence on auditory discrimination, their relative lack of exposure to letters in written form may interfere with their ability to apply these skills to reading. The present study sought to establish teachers' perceptions on phonological training for children with visual impairment, as well as methods and activities that they use to promote phonological awareness among young children with visual impairment. No study had been conducted in Kenya to fill this

research gap yet phonological training for children with visual impairment is critical for learning Braille.

Crawford and Elliott (2007) in their research on phonological methods for learning to read Braille involving six Australian Braille readers in primary schools, found out that teaching Braille letters as phonemes resulted in higher performance than teaching Braille letters as graphemes. They concluded that their findings confirmed results from a previous study with children with visual impairment (Crawford, Elliott & Hoekman, 2006) which found out that introducing Braille words as onset- rimes 'produced statistically significant better performance in comparison to instruction in Braille words as whole words' (p. 542). The results were consistent with the findings of Vik and Fellenius (2007) involving six primary school Braille readers in Norway which implied that some contractions may interfere with a style of teaching that emphasizes phonic analysis, for example, simple upper word signs (such as 'p' for people), or where contractions do not align with phonic boundaries (such as 'the' in 'other' and 'of' in 'roof').

Further, reporting on the findings of the ABC Braille study, Emerson, Holbrook and D'Andrea (2009) suggest that while young beginning Braille readers in kindergarten and standard one (ages 4-6) did not have major problems acquiring basic reading skills, they began to show 'deficiencies in acquiring higher level decoding skills' (p. 621) in second grade and above age 6 plus years. Besides, they further reported that tests that focused specifically on phonemic awareness showed most children in kindergarten (75%) had acquired 5-7 of the seven basic skills for this age range including detecting initial sounds, blending phonemes, blending word parts and

linking letters to sounds. By first grade, the children had developed seven or eight of the eight basic reading skills, including substituting initial or final consonants and blends in the final position. Children's results were much less consistent when it came to applying these phonological skills to acquire higher level skills such as recognizing CVC words with a 'Magic E' (e.g. mate), or other simple CVC words such as 'cat'. However, previously, Erickson and Hatton (2007) had identified distinct strategies including direct instruction in phonics, repeated readings and big word decoding that emphasizes morphemes, as being of great benefit to school-aged children with visual impairment and blindness.

In another study, Hatton, Erickson and Lee (2010) examined the linguistic development of twenty-two (22) young children with visual impairment and with no additional disabilities aged four to six (average age 5.4).

The study tested syllable-segmentation, 'sound-isolation', sound-segmentation skills and letter sound knowledge. The study found that the linguistic development skill of the children in the sample compared favourably with fully sighted children. The study also found that within the sample of children with visual impairment, potential Braille readers scored better on the first three tests than potential print readers. Among the possible explanations they put forward for this finding was that potential Braille readers are more attentive to the sounds in oral language than potential print readers. Another suggested reason was that parents and teachers focus more on the development of linguistic skills in potential Braille readers because they realize that these children may not acquire them incidentally through vision.

Hatton et al., (2010) conclusions are consistent with earlier findings of Millar (1997, p. 219) who found that ‘the phonological skills and preferences of young children with visual impairment should make it easier for them to learn the phonemic detection and segmentation skills that are needed for learning Braille’. In what appears to be a fitting summary of findings from the above studies, Steve *et al.*,(2011) have made the following observations regarding phonological training for young children with visual impairment:-

- i. There is general support in the literature for the view that phonological instruction is beneficial for beginning Braille readers.
- ii. Regardless of whether or not a child is using Braille there are no significant differences in the processes of reading development.
- iii. There is some evidence to suggest that children with visual impairment who undergo normal development compare well to children who are fully sighted in acquisition of early linguistic skills.
- iv. Children who are blind take longer to develop higher level linguistic skills and applying them to reading.

In view of the importance attached to phonological training and reading activities for young children with visual impairment as vital pre-Braille skills, the present study sought to find out the value ascribed to reading readiness by teachers in primary schools for learners with visual impairment in Kenya, since none of the reviewed studies had been undertaken in the country.

2.4 Professional Preparation for Teaching Braille Literacy

The status of special education in Kenya has been enhanced by the provision of diploma and degree courses in public and private universities including: Kenyatta University, Maseno University, Kenya Methodist University and Mount Kenya University (Kimeto, 2010). However, Frieman (2004) reports that principals and administrators are faced with the challenge of finding competent teachers who have the expertise in Braille to teach children who are blind and visually impaired. These teachers need to be equipped with other skills besides Braille in order to be successful. They include:-

- ❖ The ability to teach compensatory skills;
- ❖ Preparation of special learning materials;
- ❖ Assessing students' learning;
- ❖ Collaboration and consultation with other professionals;
- ❖ Understanding the physiology of the eye and the medical implications of visual impairment; and
- ❖ Teaching orientation and mobility as well as other teaching skills.

An early study by Allman (1998) observes that if teachers teaching students with visual impairment are expected to teach Braille and other related skills, they must learn these skills in their pre-service training. Further, Knowlton and Berger (1999) points out that, teachers not only need to know Braille, but also to use the new computer technologies that enhance a teacher's ability to produce Braille materials.

According to Mugambi (2012), the quality of education and training largely depends

on the teacher's academic qualification, professional training, commitment and dedication. Schools can only be effective if teachers are professionally trained and continuously in-serviced to improve their knowledge, pedagogical skills and competency. The training should go hand in hand with recognition, the lack of which may have adverse effects on teacher-learner relationship. Kimeto (2010) argues that lack of adequate trained personnel for pupils with visual impairment presents a challenge to reading and writing in Braille. Despite the government efforts to train teachers, the area of special education remains in need of trained professionals.

Njue (2009) reported that the Canadian Braille Authority (CBA) has recommended that Braille teachers must have a university degree and basic teacher certification for students with visual impairment.

Similarly, some countries have made a commitment to provide ongoing training for the teaching staff; a commitment that lacks in the Kenyan schools for learners with visual impairment. She further adds that only 57.14% of the teachers had a Diploma in special needs education, 14.28% were bachelor degree holders, while a massive 28.57% had only taken a three months' training.

In their study, Wittenstein and Pardee (1996) found that teaching programmes that focused on the teaching of reading and writing Braille produced teachers who were more confident in their own Braille skills as well as ability to convey knowledge to the students with visual impairment. They hold the view that teacher training programmes should not only concentrate on simply teaching Braille, but should also

emphasize on literacy skills and Braille teaching methods. They are of the opinion that training teachers only in the Braille code is tantamount to training of print readers by only teaching them the alphabet, expecting that this minimum ability will prepare them for the difficult task of passing knowledge to their students. This view is supported by Rex (1994) who contends that Braille must be taught by teachers who understand both the mechanisms of reading by touch and the additional challenges posed by the Braille code. Without this knowledge there may be a risk of attributing reading errors to a child's literacy difficulties rather than to incorrect finger positioning.

Further, Wittenstein and Pardee (1996) conducted a nationwide study on teachers who work with students who are visually impaired. The majority of the respondents reported that they enjoyed teaching Braille, were confident of their ability to make decisions about the learning media of their students and thought that Braille is an important learning medium. When asked about their Braille skills, however, a large percentage failed to rate them either negatively or positively. Also when asked if they believed that Braille refresher courses should be required for teachers who teach students with visual impairment, slightly less than half agreed. Thus, the teachers seemed to be reluctant to support the idea of required Braille refresher courses.

Allman (1998) reported that majority of teachers in Florida have taught for more than 10 years and their Braille-instruction skills have not been updated since their teacher training. According to Wittenstein and Pardee (1996), many teachers lack competence in teaching Braille which is disadvantageous because teachers tend to provide

instruction more readily in skills that they feel proficient in. A more recent study in the UK by Bindman and Greenaway (2011) collected data through questionnaires from 133 qualified teachers of children with visual impairment who worked with 197 Braille readers in England and Wales. The study sought to find out Braille teaching methods, models of Braille literacy acquisition and models of service delivery mostly used by specialist teachers in the UK. The findings revealed that few respondents felt they were well prepared to teach Braille literacy and most admitted to having difficulty maintaining Braille skills with only 11% regarding their own level of proficiency as 'very efficient' and 70% feeling it would be important to improve their Braille skills to teach the children they were working with.

Further, the results revealed that there was a significant difference in the training and qualifications of those teaching Braille in the classroom, a wide variation in children's Braille attainments and a big difference in the amount of Braille instruction they received.

Similarly, Nzoka (2011) investigated proficiency of primary school teachers in English and Kiswahili Braille literacy. The study was conducted in five out of the then eight provinces in Kenya targeting teachers in special schools for the blind and integrated programmes. Eighty-nine teachers were purposively sampled for the study. The findings revealed that generally, teachers lacked proficiency in Braille literacy. They scored poorly not only in the achievement test administered to them but also demonstrated lack of Braille skills in guiding their learners. Consequently, the study recommended that adequate effort be made to train teachers in Braille, so as to

increase their ability to teach learners who are blind, thereby improving their academic performance.

In another study, Hui-Yu Hung (2008) investigated the state of Braille literacy in Taiwan. The research focused on teachers' attitudes and perspectives about Braille instruction including, reading medium selection, personnel training, teachers' Braille training experiences and their competencies, Nemeth Code, assistive technology and primary Braille for young children with visual impairment. Hung observes that scanty literature exists in Taiwan on Braille teaching issues particularly, in teachers' competencies on Braille literacy and their perceptions on teaching literacy through Braille.

Mixed methods were used to collect qualitative and quantitative data from 76 in-service teachers in Taiwan who taught kindergarten, first and second grade levels and Braille beginners in different environments. The findings revealed that, the respondents agreed that Braille was an important reading medium and recognized the need for Braille knowledge in literary Braille codes especially, Nemeth Code and English Braille.

Though confident of their Braille teaching skills and determining their students' reading modes, the majority did not have adequate knowledge in early childhood special needs education, thus their curriculum depended on advice from experienced colleagues and self-study. Majority of the respondents were also aware of the increasing use of technology in teaching Braille, but were reluctant to use assistive

devices to teach young Braille beginners. Lamb (1996) reported that in order for one to become a specialist teacher for learners with visual impairment in the UK, a postgraduate teaching qualification is a pre-requisite for the entry to the specialist programmes. She argues that teaching literacy through Braille should be considered as a language based skill as opposed to physical perception skills and the mechanical aspects of reading by touch. She also strongly supports the opinion that children who learn to read and write using Braille ought to be taught by teachers who have experience in Braille and they should not only be familiar with the special skills required for reading by touch, but also be able to implement these particular skills within the whole language approach to literacy.

Spungin (1989), without citing empirical data, asserts that teachers who teach learners who are blind or visually impaired are “less-than-proficient” Braille instructors and this has contributed to the illiteracy among those who are blind or visually impaired. She concedes that part of the blame for this situation lies with the university training programmes for these teachers. According to Spungin, there are teacher preparation programmes which incorporate the instruction of Braille with the process of teaching reading and mathematics. Still, some teacher preparation programmes present Braille as a code, viewing the level of knowledge required by a Braille transcriber as sufficient for teachers’ literacy.

In one of the celebrated studies on Braille literacy, Amato (2002) did a descriptive study of standards and criteria for competency in Braille literacy within teacher preparation programmes. This was the first study that took a comprehensive look at

the content of teacher preparation programmes relevant to Braille literacy. It served two important purposes. First, the study refuted many of the premises made by Spungin (1989) which have unfortunately been used as factual reports on the status of Braille literacy preparation in teacher education programmes. Secondly, recommendations relevant to Braille literacy instruction were made for professional preparation programme specialists. The recommendations were aimed at assisting the specialists to develop teacher preparation courses which would provide comprehensive knowledge and skill development in the area of literacy.

According to Mwangi (2009), every teacher teaching learners with visual impairment must know that children are heterogeneous though visually impaired. Braille teaching methodology must therefore recognize their uniqueness and address it accordingly. Mwangi further adds that there is need for teachers of Braille to undergo in-service courses to enrich their skills in teaching Braille. Indeed, professional preparation for teachers of students with visual impairment is of paramount importance. However, literature reviewed in this section presents a knowledge gap that needs to be filled due to limited local studies on teachers' perceived competencies in Braille with reference to Braille training curriculum in academic institutions in Kenya.

The present study sought to find out teachers' self-assessed competencies in Braille literacy instruction and their views and feelings regarding Braille training curriculum or courses in teacher training programmes in Kenya. The findings may be used to inform the preparation for future training courses in Braille literacy for teachers of

learners with visual impairment in special schools and integrated programmes for children with visual impairment.

2.5 Perceptions on Uncontracted and Contracted Braille

It is generally believed that contracted Braille does not only enable Braille readers to process information faster, but also to take in large amounts of text at a time (Emerson *et al.*, 2009). It can limit the unnecessary teaching of familiar words in both Grade One and Grade Two Braille. Hong and Erin (2004) compared the reading and spelling skills of two groups of students who were taught to read Braille. The first group of students was taught to read using uncontracted Braille whereas the second group of students was taught reading using contracted Braille.

The authors reported that there were no significant differences found in performance over a variety of skills such as: comprehension, reading accuracy, reading speed and spelling ability between first instructions in the two types of Braille nor was there any evidence that ‘changing to contracted Braille later in school would impede the speed and proficiency reading’ (p. 335). While recognizing that contracted Braille takes up about a quarter less space, they did not agree with the assumption that it increases reading rates.

In the UK, Clunies-Ross (2005) summarized the contemporary debates in the United States over the use of uncontracted Braille, noting its increasing popularity with particular groups including: beginners of all ages, inclusive school teachers, children with learning difficulties and parents. She reported that uncontracted Braille is

generally regarded as an additional option rather than a substitute for contracted Braille and that it is usually introduced on the assumption that learners will make the transition from uncontracted to contracted Braille at some stage in their future learning. Clunies-Ross (2005) notes the concern in Canada about the lack of books in uncontracted Braille for early learners.

Clunies-Ross also reports of anxieties that there are no guidelines to help teachers of students make the transition from uncontracted to contracted Braille. At the same time she revealed a “heated” debate revolving around the teaching of uncontracted or contracted Braille to beginning readers in Australia, noting that “in integrated classrooms uncontracted Braille is perceived as easier to teach and manage, but that there are concerns that staff members who have only uncontracted Braille knowledge may be unable to facilitate children’s move to contracted Braille”. Clunies-Ross (2005) also reports that in Scandinavia, the policy of producing all materials in uncontracted Braille has increased the number of users and made the cost of production more economical and viable. She concluded that “the place of uncontracted Braille is growing within the range of options on offer to blind readers” and suggested that “new groups such as very young learners, those in mainstream education, older learners, children with learning difficulties, those who are adventitiously blind and people who study English as second language are finding it easier to learn” (p. 72).

As Steve *et al.*, (2011) observed, ordinary Braille learners gradually move from uncontracted Braille to contracted Braille at some point and at different rates. However, sometimes teachers may report using ‘uncontracted’ Braille throughout, but it is unlikely that no contractions get into the child’s reading and writing. This has a perplexing effect on research in this area because of the difficulties of identifying a group or cases of Braille learners who can read uncontracted English or American Braille fluently without knowledge of contractions. This perplexing effect was reflected in a five year longitudinal ABC Braille Study (Alphabetic Braille and Contracted’ Braille) which followed the progress of 42 children in Canada and the USA who were introduced to literacy through Braille (Emerson *et al.*, 2009).

The children’s teachers had settled for their approach at the beginning of the study as ‘contracted’ or ‘uncontracted’. Most students in the ‘uncontracted’ group learned contractions but not as many as those in the ‘contracted’ group. What differentiated the two groups was the degree of ‘contractivity’ involved in their instruction. The progress of five children who had learnt less than 25 contractions was compared with the five children who had been taught all the 189 contractions (Emerson *et al.*, 2009).

The study indicated that students who were reading primarily uncontracted Braille demonstrated slow reading pace and low levels of vocabulary acquisitions and spelling skills (Emerson *et al.*, 2009, p. 620) than the children in the highercontractivity group. The children who were introduced to more contractions earlier performed better on virtually all reading measures including: decoding, vocabulary, and comprehension and the use of contractions did not seem to affect

their fluency in oral reading. At a glance, one would be tempted to unquestionably support the use of contracted Braille from the start. But, it is worth noting that the two sample groups were not matched in the study. It would therefore be difficult to conclude definitively that the differences obtained between the groups were as a result of the introduction or non-introduction of Braille contractions. As the findings suggested, it could be that the students in the ‘high contractivity’ group were introduced quite early to contractions on account of their early aptitude for reading.

Until the current study was conducted, a study of this nature had not been undertaken in Kenya, hence the need to seek teachers’ perceptions on this issue. Should we teach Grade one Braille (uncontracted Braille) or Grade two Braille (contracted Braille)? Using a mixed qualitative and quantitative design, Sacks, Kamei-Hannan, Erin, Barclay and Sitar (2009) compared the social experiences of beginning Braille readers in literacy activities. The study reported that there were no significant differences in both the quality and quantity of social experiences over time between students who read and wrote in Grade one English Braille and those who were introduced to Grade two English Braille. However, children’s level of achievement in obtaining literacy skills was strongly correlated with the frequency and quality of their interactions with their sighted peers.

2.5.1 Hand Movements in Contracted and Uncontracted Braille

The process through which children read Braille has been the focus of much research since it is considered as a vital element in determining the fluency in Braille reading and speed. Therefore, the question of whether or not there is a distinction between the

patterns and characteristics of hand movements of children who use contracted Braille compared to uncontracted Braille is an important one (Steve *et al.*, 2011). In the review of the literature on the role played by hand movements in Braille reading, Wright, Wormsley and Kannei-Hannan (2009) concluded that there was no evidence that the introduction of contractions had any significant effect on hand movement patterns or characteristics.

Nor is there evidence from the literature in support of the view that the introduction of the additional complexity of contractions has a negative effect making hand movements less efficient for Braille beginners. There is also no evidence to support the view that uncontracted Braille improves efficiency of hand movements (Steve *et al.*, 2011).

2.5.2 Reading Fluency and Spelling in Contracted and Uncontracted Braille

The view that spelling is more difficult for children who are blind is common among teachers. This perception is often attributed to the belief or a misconception that children who are taught to read Grade two English Braille are rarely exposed to words in their uncontracted form (e.g. 'quite' and 'people' in contracted Braille is simply written as the letters 'Q' and 'P', respectively). Steve *et al.*, (2011) are of the view that there is a vast knowledge of research evidence into the spelling of children who use Grade two English Braille, despite the fact that research into the spelling of children who are introduced to reading and writing skills through uncontracted Braille is scarce and limited.

In another study, Clark-Bischke and Stoner (2009) observed samples of 20 Braille reading students in the USA cutting across the school age, starting from those who had no recognizable additional disabilities. Fifteen of the students used contracted Braille while five used uncontracted Braille. The study revealed that the children's spelling skills were the same as of those of sighted students. The assessment used an error analysis to describe patterns of spelling errors and targeted the number of words spelled correctly.

A distinction was made between spelling errors that were the result of 'Braille errors such as missing dots, cell reversals and spelling errors that did not result from Braille errors.

The authors observed that correction of spelling errors depends on identifying a pattern on the errors and analyzing them. They also noted that improved linguistic skills facilitate reduction in misspellings. The study makes reference to an earlier study by Clark and Stoner (2008) which found that the ability to identify and rectify Braille errors increases children's accuracy in spelling and argued that proofreading should be encouraged from an early age. The previous study also found no significant difference in spelling ability for words in isolation between print and Braille users and sheds useful light on the issue of spelling and contracted/uncontracted Braille. Out of the twenty-three students studied, five students who used uncontracted Braille had 'spelling assessments that were comparable to those of the 18 students who used contracted Braille' (p.559).

In a finding from the ABC project that is described as 'surprising', Emerson, Holbrook and D'Andrea (2009, p. 618) note that spelling was noted as a strength for the children in the studying spite of whether or not they used contractions or not. 84% of the children in the study were 'at or above grade [age] level' in spelling' (p. 617) whereas children who had been introduced to higher numbers of contractions did better in spelling than the children who had been introduced to fewer contractions. The group with fewer contractions was not essentially poor spellers but the 'top spellers' were all students who had learned 'many' contractions.

While the findings support the view that contractions do not hinder the development of good spelling skills, the puzzling difficulties of the sampling discussed do not allow for conclusions to be drawn about the relative effects of learning through contracted and uncontracted Braille on spelling performance.

Although some teachers and supporters of uncontracted Braille criticize contracted Braille on the basis that contractions have an adverse effect on reading fluency, efficiency of hand movements or spelling when reading, the findings of the ABC study appear to counter these criticisms. Steve *et al.*, (2011) argue that, there is no evidence that uncontracted Braille has significant benefits in reducing pauses, regressions or scrubbing on Braille readers. Further, they maintain that use of contractions does not seem to affect fluency in oral reading and there is no clear evidence that children who use contracted Braille are likely to be poor spellers than children who use uncontracted Braille.

The present study sought to determine teachers' perceptions on the English Braille code, particularly on the effects of learning through contracted or uncontracted Braille on spelling performance and reading fluency. Once this knowledge gap is filled, proponents of Kenya Braille Authority may be in a position to advise policy-makers on the way forward in the teaching of English Braille code so as to effectively serve the learners with visual impairment.

2.6 Print and Braille Literacy for the Low Vision

The degree of vision loss, efficiency of vision use, parental preference and prognosis influences decisions about which format to use in developing and maintaining literacy skills for children with severe visual impairment (Corn & Koenig, 2002). Koenig and Holbrook (1995) designed the Learning Media Assessment (LMA) procedure to help teachers determine whether children should receive literacy instruction through a combination of Braille and print (dual media), Braille or through print. Stressing that the results of the LMA should not be regarded as the only basis, they recommended that the continued appropriateness of the child's literacy medium should be assessed and determined on regular basis.

2.6.1 Assessment of Reading

It is generally accepted that the accurate assessment of literacy performance is important in informing literacy teaching. Assessment provides teachers with an insight into pupils' progress and the particular problems they may be experiencing. This applies to the teaching of literacy through Braille as it does to teaching literacy through print. Such assessment tools can also be used in arriving at decisions about appropriate literacy media for children with visual impairment (Steve et al., 2011).

In two specific studies, Greaney et al. (1998) and Douglas *et al.*, (2002) report on adaptations made to the Neale Analysis of Reading Ability (NARA); a reading test designed for fully sighted children aged six to thirteen that tests comprehension, reading speed and accuracy.

The authors' aim was to generate norm scores for Braille and low vision print readers respectively. Douglas *et al.*, (2002) tested the reading of 476 children with low vision using an unmodified print version of the NARA.

The data revealed that the average reading ages for accuracy, comprehension and speed for children with low vision fall below their chronological age. Greaney *et al.*, (1998) also measured the reading of 317 Braille readers (in the UK and Ireland) using a Braille version of the NARA. The data revealed that the average reading ages for accuracy, speed and comprehension for the sample were not only below those of their fully sighted peers but more importantly, they were below the reading ages of the low vision readers in Douglas *et al.*, 's sample.

In the USA, the assessment of Braille literacy skills is commonly based upon reading measures developed for children who are fully sighted. For example the ABC project adopted annual literacy assessments that included the following: the Texas Primary Reading Inventory (TPRI, 2003), the Brigance Comprehensive Inventory of Basic Skills (BRI, Brigance 1999) the Johns Basic Reading Inventory (Johns, 2003), since they are commonly used in elementary classrooms and are easily available in Braille (Emerson, Holbrook & D'Andrea 2009 p. 613).

The present study sought to establish whether there were tools developed for the assessment of Braille reading or designed to afford comparisons with a reading performance of children who are fully sighted with a performance of other Braille readers.

If these tools existed, were they compatible with contracted or uncontracted Braille use or both? The Braille version of the NARA appears to be unique in that it has been standardized for Braille readers and print readers as well. This helps the user to make meaningful comparisons with sighted children. It gives a sense of what might be anticipated as a reading speed for a Braille reader of a given age. This is necessary when carrying out a meaningful diagnostic analysis of a child's reading.

The study also sought teachers' thoughts on a standardized Braille Assessment since a study to investigate such perceptions had not yet been conducted in Kenya. Clearly a major decision in future debates concerning the assessment of literacy is whether tools that are developed for the assessment of Braille reading should be designed to permit comparisons with the reading performance of children who are fully sighted or with the performance of other Braille readers. Another consideration was whether they should be compatible with contracted or uncontracted Braille use or both.

2.6.2 Reading Media Choice

In the education of students with visual impairment, the choice of reading media has become a focus of research. Lusk and Corn (2006b) are of the view that while reading speed should not be the only requirement, it is important for children to develop a 'functional and competitive reading speed in either print or Braille' (p. 655). Children who learn to read through print and then transfer to Braille require teaching methods that are different from those required for children learning to read beginning with Braille.

For children who are print users and who experience deteriorating vision, the question often becomes one of “when and how” rather than “whether” to introduce Braille and the decision can be a “profoundly emotional one” (Wormsley&D’Andrea 1997). A relatively small percentage of children will require access to both Braille and print, however, most of them will focus on one medium.

A UK study by Rogers (2007) found that only 107 children used both print and Braille for reading or writing (approximately 17% of the population of children aged between five and sixteen used Braille). Rogers suggested that because teachers often see visual processing being faster and more efficient than tactual processing, print initially may be viewed as the preferred format for children with very low vision, especially in lower primary classes, where children are not required to process large amounts of information. Almost all the children (86%) in her sample had begun by learning print in kindergarten, but by age seven, 54% had been introduced to Braille. The study found that dual media users did not use Braille and print in equal amounts and identified three groups: predominantly print users, predominantly Braille users and children who appeared to use both print and Braille successfully. Some children who were predominantly Braille users preferred using print for curriculum subjects where there were relatively small amounts of text to process for example mathematics. In the same study, teachers reported parents’ attitudes as being a significant factor in determining the extent to which children who used print accepted Braille.

It was reported that positive attitude to Braille among parents, class teachers and learning assistants was essential if Braille was to be introduced successfully. The present study sought teachers' perceptions on dual media and at the same time to find out whether children with low vision were exposed to Braille literacy in special schools. Lusk and Corn (2006a) observed that a single-medium policy was common in the United States in the 1970s but currently, dual media is regarded as a positive advantage for some children. They examined dual-media learners in the United States and investigated the instructional approaches and curricular decisions in teaching dual media to students with low vision, reporting the teachers' expectations for future levels of literacy, the students' present literacy levels and reading rates. The study not only found a generally positive attitude towards both print and Braille among the students, but also that the most common factor in teachers' decision to introduce dual media instruction was a major concern among teachers and parents owing to the progressive nature of the child's eye condition. Concerns about print reading stamina and speed were also expressed.

2.7 Perceptions on Teaching Literacy through Braille and Assistive Technology

The relevance of Braille in the modern technological era has become a heated debate among educators of learners with visual impairment. In the USA, controversy surrounded the publication of an article in the New York Times Magazine in December 2009 when a successful blind business executive questioned the continuing relevance of Braille in the new information technology era, describing Braille as 'an outdated means of communication which for the most part should be abolished'

(Aviv, 2009). The article prompted a strong defense for Braille in publications such as the NFB's Braille Monitor.

In the UK, a recent RNIB-funded research project investigating Braille teaching to adults with acquired sight loss (Douglas, Weston, Franks, & Clements, 2009) identified a perception by some rehabilitation workers and blind people on the need to make a choice between teaching or learning Braille and teaching / learning technology skills. In their comprehensive book 'Assistive Technology for Students who are Visually Impaired' Presley and D'Andrea (2008) discuss the impact of developments in technology and its effect on access to information for learners who are blind in inclusive schools. They underscore the rapid changes in a society where much of the information is digital in origin and has not been converted from print, but is created, shared and accessed in electronic form.

According to Presley and D'Andrea (2008), indications about when to introduce specific technology skills can best be determined by looking at the tasks sighted classmates are doing. They reflect on the commonly held view that children with visual impairment need to be able to use a combination of technological tools to accomplish literacy tasks in both printed and electronic form. They describe a 'technology practice that begins with low tech tools, moving to increasingly higher tech tools as children's skills increase with age.

Other researchers and commentators have adopted a different standpoint or approach, advocating for early exposure to technology to support the development of literacy. In an investigation on the use of technology in early literacy teaching, Murphy, Hatton

and Erickson (2008) carried out a survey of specialist visiting teachers of pupils with visual impairment who work with preschool children in the USA.

They found that most preschool children with visual impairment were not given access to assistive technology devices that may potentially facilitate literacy development, with only 3% always, providing access to electronic text from the internet.

In another study, Kelly and Smith (2008) found that young people with visual impairment used computers and telephones for social purpose not only less often than sighted children, but also less often than some other disability groups. They identified the use of assistive technology devices and software to access digital social networking forums as a 'component of the specialized Expanded Core Curriculum that is taught to students who are visually impaired' (p. 538).

A year later, Kelly (2009) analyzed data collected between 2001-2004. It revealed that between 59% and 71% of the students with visual impairment in the USA who were most likely to benefit from assistive technology did not have the opportunity to use it. They argued that access to information and social networking websites through mobile devices, via adaptive hardware and software is vital if children and young people who are visually impaired are to connect fully with others. Kelly recommended that immediate attention be given to this area which has the potential to overhaul the education of students who are visually impaired.

In another American study on the use of assistive technology for students with visual impairment, Zhou, Parker, Smith and Griffen-Shirley (2011) reported that the lack of skills and knowledge by teachers of pupils with visual impairment was a main barrier

hindering the use of technology in schools. In an attempt to understand the specific deficits in knowledge and skills of qualified teachers for pupils with visual impairment, they asked 165 teachers in Texas to compare the levels of expertise they perceived they had with the level of those they perceived they were expected to have across 74 competencies for teachers of pupils with visual impairment related to Assistive technology as defined by Smith *et al.* (2009).

The survey revealed a self-assessed deficit in 55 of the 74 competencies. They also found that only 41% of the teachers surveyed felt confident or very confident that they could teach most or all forms of assistive technology. Among the competencies where teachers felt they were lacking were: assistive devices relating to Braille literacy and its application, use of screen reading software, use of Braille translation software, electronic Braille devices and sourcing funds for technology devices. The researchers concluded that training in this area needed strengthening through increased emphasis on the topic in specialist teacher preparation programmes and through better in-service training for qualified teachers of pupils with visual impairment. Given the pace of change in this sector however, they believed that the development of ‘assistive technology specialists’ as ‘new types of professionals in the field of visual impairment will ultimately be necessary’. (p. 208)

In Kenya, digital literacy programme has been introduced in all primary schools nationwide. For learners with visual impairment, specialist teachers will have to train in the use of assistive technology. The question was: Did teachers at the time of the study consider technology superior to Braille or were they of the view that the two

were complementary? It is for this purpose that the researcher sought to establish teachers' perceptions towards the use of technology and Braille in teaching literacy to learners with visual impairment. Literature in this area is nonexistent in the country.

2.8 Summary

In this chapter, literature was reviewed on Braille literacy according to the objectives formulated to guide the study. Both foreign and local references were critically examined and analyzed, majority of which were derived from primary studies. The review has clearly shown that limited research on teachers' perception on teaching literacy through Braille has been conducted in the African context, particularly in Kenya.

Some of the research and knowledge gaps identified in the related literature reviewed deserve urgent attention since Braille literacy skills are crucial for the success of learners with visual impairment at school and in the society. For instance, perceptions of teachers in Kenya towards Braille literacy for young children with visual impairment in Kindergarten are yet to be established. Similarly, views of teachers regarding their professional preparedness and Braille training curriculum in academic institutions deserve systematic investigation, analysis and documentation.

Closely related to these knowledge gaps is the need to investigate the decline of Braille literacy in schools for learners with visual impairment, as well as among the adult blind. Other gaps identified in this section of literature review that need to be filled through research in Kenya include: teachers' reactions to the introduction of

digital technology in schools for learners with visual impairment, teachers' perspectives about print and Braille literacy for the low vision and teachers' attitudes towards teaching contracted and uncontracted Braille.

The present study addressed these issues to a large extent. Since limited research in this field has been accomplished in the African context, especially in Kenya, the present study sought to help fill that void in the existing literature by analyzing the perception of teachers on Braille literacy instruction in schools for learners with visual impairment. As described in the next chapter, a detailed questionnaire was developed for the study designed to answer seven research questions.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter is presented and discussed under the following sections: the research design, variables, location of the study, target population, sampling techniques and sample size. Other sections presented and discussed in this chapter are: research instruments, pilot study, validity and reliability, data collection techniques, data analysis and logistical and ethical considerations.

3.2 Research Design

A research design is a plan that outlines how a particular study is to be conducted. According to Gay (2009), a research design is a blueprint adopted by a researcher to find answers to research questions or for testing the research hypothesis. The study adopted descriptive survey design which involves collecting data in order to understand a given phenomenon or to describe the current status of the phenomenon under investigation. The design was found appropriate for this study because it helped the researcher to collect data based on opinions, attitudes, values and perceptions of special primary school teachers on Braille literacy instruction in Kenya. Best and Khan (2010) indicated that descriptive survey design is concerned with determining the nature of prevailing conditions, practices or attitudes, perceptions or opinions that are held, processes that are going on or trends that are developed.

Mugenda and Mugenda (2009) also maintain that a survey design attempts to collect data from members of a population in order to determine the current status of that population with respect to one or more variables.

According to these authors, a descriptive survey determines and reports the way things are descriptively.

Further, Orodho (2009) also points out that the survey is the most frequently used method when collecting information about people's attitudes, perceptions, habits or any of the variety of education or social issues. Thus the objective of descriptive survey design is to accurately describe given activities, objects, procedures and persons. Wrench, Thomas-Maddox, Richmond and McCrosky (2008) broadly defined survey research as a method employed in social science for collecting quantifiable information about a specific group of people by asking the group members questions about the values, beliefs, individual attitudes, behaviours, knowledge and perceptions.

The present study was intended to ascertain the perceptions of teachers in primary schools for learners with visual impairment on Braille literacy instruction by collecting data from the sample of the classroom teachers and their headteachers through questionnaire and interview schedules. MacMillan and Schumacher (2010) observe that, in descriptive survey design, the researcher selects a sample of subjects and administers a questionnaire or conducts interviews to collect data. The characteristics of descriptive survey outlined herein were relevant to this study, hence the choice of

descriptive survey design for analyzing the teachers' perceptions on Braille literacy instruction in Kenya.

The study also employed mixed methodology by utilizing both qualitative and quantitative approaches in data collection and analysis. Information from the selected sample was obtained through questionnaires and interviews. The application of mixed methods procedures has some added advantages. In particular, the design format is effective when examining data involving respondents' attitudes and perceptions. This type of triangulation method is valuable in that the biases or limitations of one method are compensated by the other (Cresswell, 2008; McMillan & Schumacher, 2010). In this context, these features of mixed methods design were judged most appropriate for carrying out the present study which sought to analyze teachers' perceptions on instruction of Braille literacy in schools for learners with visual impairment in Kenya.

3.3 Variables

According to Cherry (2009), a variable is a characteristic of interest that a researcher would like to handle, observe or manipulate in the research. There are two types of variables; independent and dependent variables. An independent variable is one that influences or causes change in another variable, whereas a dependent variable is one that is influenced or changed by one or more variables (Mugenda&Mugenda, 2012).

In this study, the independent and dependent variables are discussed.

3.3.1 Independent Variables

The study considered the following as independent variables: Teacher factor, phonological training, professional preparation, teaching the Braille code, provision of large print and assistive technology.

3.3.2 Dependent Variable

The dependent variable in this study was instruction of Braille literacy. The variables were not manipulated in the study as the researcher intended to collect information from teachers regarding Braille literacy. Survey research is primarily concerned with determining “what is” and as Borg and Gall (1996) have observed, unless researchers first generate an accurate description of an educational phenomenon as it exists, they lack a firm basis for explaining or changing it. Some of the most influential calls for reform on the educational system have used the findings of descriptive research to make their case.

3.4 Location of the Study

The study was conducted in five primary schools for learners with visual impairment in Kenya. The five schools are located in different counties in the country. They included: Thika School for the visually impaired, St. Lucy School for the visually impaired, St. Oda School for the visually impaired, Kibos School for the visually impaired and St. Francis School for the visually impaired. Realizing that maps of these schools were not available, the researcher obtained and provided the following brief directions to the specific schools used in the study.

1. *Thika School for the visuallyimpaired*

The school is 40 kilometers away from Nairobi city. It is situated in Thika town constituency within Kiambu County. This is a mixed boarding primary school, adjacent to Thika High school for the blind, Chania Boys High school and Chania Girls Secondary School.

2. *St. Lucy's School for the visuallyimpaired*

This school is located in Igoji Constituency within Meru County. It is a mixed boarding primary school adjacent to Igoji Teacher Training College and St. Lucy's high school for the visually impaired.

3. *St. Oda School for the visuallyimpaired*

The school is located in Gem Constituency within Siaya County. It is a mixed boarding primary school. The nearby schools are Aluor Mixed Primary school, St. Benedete Girls Primary school and St. Cecilia Aluor Girls Secondary school.

4. *Kibos School for the visuallyimpaired*

This school is located in Muhoroni Constituency within Kisumu County. It is a mixed boarding primary school. The nearby schools are Kibos Primary school, Disciples of Mercy Primary school, Disciples of Mercy Special Unit and Nyamonge Primary school.

5. *St Francis School for the visually impaired*

This school is situated in Kapenguria Constituency within West Pokot County. It is a mixed boarding primary school. The nearby schools are Ebenezer Mixed Secondary school, Kapenguria Boys High School and Chewoyet High School. These schools were identified as a suitable study locale because first, they were the only special

primary schools for learners with visual impairment in the country, except Likoni School for the visually impaired which was used for the pilot study. Secondly, teachers who taught in these five selected schools for the study were specially trained to teach learners who use Braille as their medium of instruction and were therefore in a position to provide relevant information required for the present study.

At the time of the current study, there were therefore six special primary schools for learners with visual impairment in Kenya.

3.5 Target Population

In research, population simply refers to the large group of people, events, or objects with similar characteristics which the researcher is interested in so as to obtain information to make generalization about the research. McMillan and Schumacher (2010) explain that research population is a group of elements or cases, whether individuals, objects or events, that conform to specific criteria and to which the researcher intends to generalize the results of the research.

Thus, the target population is the units from which the information is required and actually studied. Ary, Jacobs and Sorensen (2010) noted that a target population is the large group to which the researcher wishes to generalize the results of the study. In this study, the target population was made up of all headteachers and their classroom teachers in five primary schools for learners with visual impairment in Kenya. Thus, the study targeted a total of 137 participants comprising 5 headteachers and 132 classroom teachers in the five schools. These were trained teachers registered with

The Teachers Service Commission (MOE, 2014). The headteachers were included in the study because they were in charge of school administration. Table 3.1 shows the breakdown of the target population for the headteachers and the teachers in the respective schools.

Table 3.1: The distribution of target population of headteachers and teachers

Schools	Blind Teachers			Sighted Teachers			Hdtrs	G.TOTAL
	Male	Female	Total	Male	Female	Total		
Thika	2	4	6	12	16	28	1	35
St. Lucy	3	2	5	11	13	24	1	30
St. Oda	2	1	3	6	7	13	1	17
Kibos	2	2	4	10	12	22	1	27
St. Francis	2	3	5	9	13	22	1	28
TOTAL	11	12	23	48	61	109	5	137

Table 3.1 shows the total target population of 137 participants who were expected to take part in the study. This comprised 132 teachers and 5 headteachers from the 5 primary schools for learners with visual impairment. The 132 teachers were made up of 59 male and 73 female teachers. Furthermore, the 132 teachers consisted of 23 visually impaired and 109 sighted teachers.

3.6 Sampling Techniques and Sample Size

3.6.1 Sampling Techniques

Sampling is the process of selecting a small group out of the target population which is to be included in the study. This should be conducted scientifically to ensure that the sample selected represents the large group from which it was drawn. Polit and Hungler (1996) refer to sampling as a process of selecting a portion of the population

to represent the entire population in the study.

According to Mugenda and Mugenda (2003), the main purpose of sampling is to secure a representative group which will enable the researcher to gain information about the population.

There are several procedures by which a researcher can select a sample to ensure its representativeness. Mugenda and Mugenda (2003) grouped these procedures into two categories. These are probability sampling and non-probability sampling. The probability sampling methods include simple random sampling, systematic sampling, stratified sampling and cluster sampling while the non-probability techniques involve methods such as convenience sampling, quota sampling, purposive sampling and snowball sampling. In view of the nature of the population for this study, multiple sampling techniques were adopted to select the schools and the respondents from the various strata within the schools. These involved both probability and non-probability sampling procedures. The study used purposive sampling, stratified random sampling and simple random sampling.

Five (5) primary schools for learners with visual impairment in Kenya and their headteachers or principals were purposively selected to participate in the survey. They included: Thika School for the visually impaired, St. Lucy School for the visually impaired, St. Oda School for the visually impaired, Kibos School for the visually impaired and St. Francis School for the visually impaired. These schools were considered because they had the highest student enrolment against other schools for learners with visual impairment. In purposive sampling, the researcher decides the

cases to be included in the study on the basis of their judgment of their typicality (Ary, Jacobs, Sorensen & Walker, 2014). Thus, in purposive sampling, researchers purposively choose subjects who in their opinion are thought to be relevant to the study.

Orodho (2009) contends that in purposive sampling, the investigator relies on his or her expert judgment to select units that are representative of the population. Ary *et al.*, (2014) further noted that purposive sampling has been useful in attitude, perception and opinion surveys as well as analysis.

Stratified random sampling method was also adopted to select a sample of fifty-three (53) teachers from the target population. According to Bryman (2004), stratification involves partitioning the whole population into homogenous sub-groups and then selecting respondents separately from each sub-group. In this study, stratification was applied on the basis of gender of the teacher and type of school and proportions assigned to each stratum based on their ratios in the target population.

Ary *et al.*, (2014) established that in this kind of sampling, the researcher may either take equal numbers from each stratum or select a proportion in relation to the size of the stratum in the population. Thus, each group or stratum was represented in the sample in exact proportion to its frequency in the total population. As indicated by Ary *et al.*, (2014), stratified sampling is more desirable when the population consists of a number of subgroups or strata that may differ in the characteristics being studied. In the present study, the stratification was done in two phases. In the first phase, the

teachers were stratified into two strata; sighted teachers and teachers with visual impairment. In the second phase, they were stratified into male and female teachers. This procedure was considered because the schools had different proportion of male-female ratios as well as different ratios for sighted and teachers with visual impairment with some schools having more than others.

The stratification technique was to ensure that each segment of the population was adequately represented in the study sample. According to Asher (1995), stratified sampling technique is said to be very reliable with a high degree of representativeness of results. Finally, simple random technique was adopted to select teacher respondents from each school and stratum who responded to the questionnaire.

Biggman (2008) describes simple random sampling as the procedure that allows each member of the subset an equal probability of being selected to participate in the study. The responses provided by teachers who were selected through the simple random method were used to generalize the study results to the target population, thereby minimizing error. Orodho (2009) asserts that random samples produce research data that can be generalized to a larger population within margins of error that can be determined statistically. The assertion by Orodho has been corroborated by Wrench,*etal.*, (2009) who opines that random sampling allows a researcher to generalize the results to the population, thereby enhancing the internal and external validity of the study. There are several techniques of selecting samples through simple random selection. However, this study used tossing approach in selecting the teachers

from each school where the population in each subgroup was only two (2) while lottery technique

was used in the schools where the teacher population was more than two (2). These methods were selected to ensure validity of the study.

Orodho (2009) has indicated that the choice of a particular technique depends on the size of the population from which the sample is to be drawn. The author suggested that if the population is for instance; two (2) and the researcher intends to select only one respondent, then tossing a coin would be the most appropriate selection technique. In schools where the population was only two, the two teachers were given an equal chance of being selected by researcher deciding either a head or tail prior to the sampling process would participate. The researcher or his assistant conducted the toss and a neutral process was used to select the teachers who participated in the study. In cases of schools where the sub-group of the population was more than two (2), “yes” or “no” procedure was used by writing ‘yes’ or ‘no’ on a piece of paper which was folded into equal size and shape and placed in a well-mixed container. Teachers were then requested to pick one piece at a time. After a teacher had picked the paper, it was put back in the container before the second teacher had his/her turn. Those who picked “yes” were included in the study. According to Wrench, et al., (2009), random sampling is the “purest” method for collecting a probability sample.

3.6.2 Sample Size

The sample size for the study was forty per cent (40%) of a population of 132 teachers which was found to be representative of the entire population. This translated into

approximately fifty three (53) teachers. Mugenda (2003) advances the view that “where time and resources allow, a researcher should take as big a sample as possible. With a large sample, the researcher is confident that if another sample of the same size were to be selected, findings from the two samples would be similar to a high degree.” Usually, small samples do not reproduce the salient characteristics of the accessible population to an acceptable degree. Table 3.2 shows the distribution of the strata sample size for headteachers and teachers.

Table 3.2: Distribution of Sample Population

Schools	Blind Teacher			Sighted Teachers			Hdtrs	G.TOTAL
	Male	Female	Total	Male	Female	Total		
Thika	1	1	2	5	7	12	1	15
St. Lucy	1	1	2	5	6	11	1	14
St. Oda	1	1	2	2	5	7	1	10
Kibos	-	1	1	3	5	8	1	10
St. Francis	-	1	1	3	4	7	1	9
TOTAL	3	5	8	18	27	45	5	58

Table 3.2 reveals a total sample size of 58 participants which consisted of 5 headteachers who were selected purposively and 53 randomly selected teachers obtained from the target population. The 53 teachers were made up of 8 teachers with visual impairment and 45 sighted teachers. Further, distribution from Table 3.2 shows that out of the selected 53 classroom teachers, twenty-one (21) were male, while thirty-two (32) were female teachers. Out of the 21 male teachers, 3 were visually impaired and 18 were sighted while in the case of the female teachers, 5 were visually

impaired and 27 were sighted. The number of male and female teachers in the sample size depended on their respective proportional representation in the target population.

3.7 Research Instruments

The researcher used questionnaires as the main tool to collect the required data from the field. Closed-ended and open-ended questions were used to provide needed information for the study. To supplement the questionnaires, interviews were conducted to gather more in-depth information from the headteachers.

3.7.1 Questionnaire for Teachers

A questionnaire consists of formal questions framed for respondents to provide answers. The researcher developed a forty-four (44) item questionnaire with some related sub-items for the analysis. Twelve (12) items were adapted from Revised Wittenstein Version, 2005. The adaptation of standardized items was in line with the view of Obeng (2013) who asserts that in designing a questionnaire for research purpose, the existing questionnaire needs further adaptation before it can be used for actual data collection. The questionnaire comprised eight sections. The first section sought demographic information on the participants while the second section consisted of two items relating to research question one on factors influencing instruction on Braille literacy in schools for learners with visual impairment.

The third section consisted of nine items relating to research question two on teachers' perceptions towards phonological training and reading activities for young Braille learners, while the fourth section had ten items relating to research question three on teachers' perceptions regarding their professional preparation in Braille literacy instruction. The fifth section had five items relating to research question four on teachers' perceptions concerning teaching contracted and uncontracted English

Braille code in schools for learners with visual impairment. Section six and seven had ten and seven items on Braille literacy for the low vision and the use of technology in Braille literacy relating to research question five and six respectively.

Section eight had one open-ended question on teachers' comments about their professional preparation as specialist teachers for learners with visual impairment. According to Orodho (2012), each item in the questionnaire should be developed to address a specific objective and research questions in the study. The researcher adopted this practice for the present study.

3.7.2 Interview for Headteachers

According to Patten (2009), an interview is a method of field investigation whereby a researcher meets respondents and through interaction asks specific questions to find answers to the research problem. In this study, interview data was elicited from headteachers of the sampled schools to complement the quantitative data that was obtained from the sampled teachers. The purpose of interviews is to supplement data that has been collected through other methods (Galletal.,1996). The interview comprised nine questions meant to solicit information relevant to the study objectives. The interview items were open-ended to enable the researcher obtain qualitative data for the study. According to Gall,*et al.*, (1996), the use of interview is more appropriate in collecting qualitative data because it permits open-ended exploration of issues and elicits responses that are couched in the unique words of the respondents.

The interviewer asked semi-structured questions and then probed accordingly in order to obtain more complete data (Orodho, 2009). Gall *et al.*, (1996) also advance the view that interviews enable the researcher to probe deeply into respondents' opinions and feelings and obtain more information to clarify vague statements.

These authors further state that, the use of interviews in data collection further builds trust and rapport with respondents, thus making it possible to obtain information that the individual probably would not reveal by any other data collection method. The interview helped the researcher to generate quality qualitative data that was analyzed through the lenses of the researcher to address the research problem. Cresswell (2008) asserts that interviews yield high qualitative data that is credible, trustworthy, authentic and balanced through systematic data collection procedures. The advantages associated with the use of interview made it one of the best tools for data collection in the current study.

3.8 Pilot Study

Pilot studies are pre-testing approaches designed to obtain preliminary information on how new research instruments work. According to Patten (2009), the essence of pilot testing is to enable the researcher to determine if there are ambiguous questions or questions that participants may refuse to answer. Before embarking on data collection for the current study, the questionnaire and the interview were pre-tested using a selected sample of teachers and a headteacher from Likoni School for the visually impaired. Pre-testing enabled the researcher to modify, restructure and remove ambiguous items from the teachers' questionnaire.

For instance, an item that asked participants to indicate whether they had a visual impairment was revised and instead asked respondents to indicate the type of disability they might have had. The pretesting provided opportunity to the respondents to make criticisms and recommendations for improving the research instruments.

The interview guide was also subjected to pilot testing to ensure that the interview items elicited a reasonably unbiased data. During the pilot testing of the interview guide, the researcher also adopted tape recording method. Galletal., (1996) indicates that tape recording pilot study interviews is important even if a tape recorder is not used during the main interview procedure. By playing back the interview, interviewers can gain insights into how they handled questions and become aware of problems that escaped their attention during the interview itself (Gall,*etal.*,1996). Only five teachers and one headteacher were used for the purpose of the pre-testing exercise.

Patten (2009) emphasized that pilot studies are usually conducted with small sample sizes. The sample population that was used during the pre-test had similar characteristics to the actual sample population that was used in the main study. Galletal., (1996) opines that the pre-test should include a sample of individuals from which the researcher plans to draw respondents. Besides providing the researcher with hands-on experience in data collection and giving an insight into the feasibility of the main study, the pilot testing exercise also helps in enhancing the validity and reliability of the instruments.

3.8.1 Validity

In this study, the issue of validity of the research instruments was addressed. Validity is the degree to which a test measures what it is supposed to measure (Kothari, 2014). In other words, a research instrument is said to be valid when it measures what it is designed to measure and accurately performs the functions it is purported to perform (Patten, 2009). The researcher adopted various methods to ascertain the accuracy of both the teachers' questionnaire and the interview for the headteachers.

Wrench, Thomas-Maddox, Richmond and McCrosky (2008), identified three primary approaches to enhance validity; namely face or content validity, predictive or concurrent validity and construct or factorial validity. In the present study, face and content validity approaches were used to determine the validity of the research instruments. According to Wrench *et al.*, (2008) face and content validity is the validity approach most commonly employed by researchers because of its inherently subjective nature. Face validity involves a casual and subjective inspection of the test items to judge whether they cover the content that the items purport to measure (Gall et al., 1996). In using this approach, the researcher critically inspected the items to ascertain their face validity. The researcher then examined the content of the research instrument to find out whether on its "face" it appears to be related to that which the researcher wished to measure (Wrench *et al.*, 2008).

Further, the researcher examined the content validity of the instruments. Content validity was tested to ascertain whether the items in the questionnaires were suitable for the study. Content validity according to Gall *etal.*, (1996) is the degree to which responses yielded by the instrument adequately represent the content, or the conceptual domains that the items purport to measure. To determine the content validity, the researcher made judgments on the appropriateness of the content of the instruments with the help of experts.

Thus, to establish whether the instruments measured what was intended, expert opinion and judgment from university supervisors were sought. Galletal.,(1996) advised that content validity should be determined systematically by content experts. Questions or items found to be inconsistent with the domain or content of interest were identified and modified to ensure clarity of information in the questionnaires. Difficult questions were re-framed using appropriate language that could easily be understood by the respondents. This was achieved through discussions, comments and suggestions in relation to the research objectives.

3.8.2 Reliability

Reliability as a measurement concept has been defined by various authors. It has to do with ensuring that the research instruments to be used in measuring a particular phenomenon or collecting a research data are accurate. According to Wrench *etal.*, (2008), reliability refers to the accuracy that a measure has in producing stable and consistent measurements. For the instrument to be regarded as reliable, it should be able to yield comparable scores on repeated administration. Thus, an instrument is

said to be reliable if it measures whatever it is measuring consistently. As reported by Wrench *et al.*, (2008), there are four statistical approaches that can be used to determine the coefficient of reliability. These include test-retest, alternative form, split-half and internal consistency reliability. To determine the reliability of the questionnaire for this study, internal consistency technique was used. The internal consistency method of estimating reliability coefficient requires only a single administration of an instrument.

According to MacMillan and Schumacher (2010), the internal consistency technique is the most common type of reliability because it can be estimated by giving one form of a test once. The research instruments for this study were administered once and Cronbach Alpha formula was employed to compute the reliability of the instrument. As indicated by Cronbach (1951) cited in Wrench *et al.*, (2008), the Cronbach Alpha reliability test is the most popular single administration reliability test. It determines agreement of answers on questions targeted to specific traits. Besides estimating reliability coefficient, the Cronbach coefficient alpha has an added advantage of reducing the number of times the researcher is required to visit the field for data collection.

Wrench *et al.*, (2008) note that, the Cronbach Alpha reliability test is probably the most consistently reported reliability test in social sciences research. Thus, Cronbach Alpha is generally considered to be a superior procedure on statistical grounds. It is used when answers are made on a scale of some kind rather than as right or wrong.

Since most of the items in this study were in the form of scale measurement, requiring the respondents to indicate their levels of agreement, the Cronbach Alpha reliability approach was judged most appropriate in estimating the reliability of the instruments. In determining reliability, the higher the reliability coefficient, the more consistent participants are when filling out the questionnaire. Thus, in this study, the reliability coefficient of 0.842 was used to judge the reliability of the instruments. A reliability coefficient of 0.842 or more implies that there is a higher degree of reliability of the data (Mugenda&Mugenda, 2003). Orodho (2009) opines that a reliability coefficient of 0.75 is considered high enough to judge the reliability of the instrument.

3.9 Data Collection Techniques

Data collection refers to gathering information to serve or prove some facts (Kombo& Tromp, 2006). The study focused on the use of primary data which was collected by administering interview and questionnaire to the sample population. In the first place, the researcher obtained an introductory letter from Kenyatta University and Ministry of Education Science and Technology after approval of the proposal by the Graduate School.

Secondly, preliminary contacts were made with the headteachers of the schools to discuss the purpose of the study and thereby creating rapport with them. Orodho (2009) asserts that it is important for a researcher to have a practical appreciation, familiarity and rapport with the community of respondents. The researcher planned to spend approximately six weeks in the field on data collection.

The first four weeks were used for questionnaire distribution and administration to the teachers while the remaining two weeks were used to conduct the interviews. In view of the wide coverage of the study, two research assistants were engaged in the data collection process. Before embarking on data collection, a two-day training was planned for research assistants on the application of research instruments in the field.

Mugenda and Mugenda (2003) advise that research assistants should be trained if objective and reliable information is to be obtained from research participants. The research assistants helped the researcher to administer and collect the questionnaires. Some of the questionnaires were transcribed into Braille for teachers with visual impairment. After completion of questionnaires by the teachers, the researcher revisited the five selected primary schools to personally conduct interviews with the headteachers. Semi-structured interview schedules were conducted by the researcher using an audio recorder and a Braille laptop. Responses were recorded and transcribed for analysis. A tape recorder speeds up the interview process because the researcher does not need to write and it reduces the tendency for the interviewer to make unconscious selection of data in the course of recording (Mugenda&Mugenda, 2003).

3.10 Data Analysis

By using Statistical Package for Social Sciences (SPSS Version 22.0), the demographic information of 58 teachers was analysed by means of descriptive statistical technique. The quantitative data obtained from the teachers was also analysed by frequencies, percentages, means and standard deviations.

These are mathematical techniques for organizing and summarizing a set of numerical data. Thus, descriptive statistical techniques were used to obtain frequencies, analyse and summarise data before making inferences. The descriptive statistics was used to analyze objectives one to six by computing the percentages, mean and standard deviations of the variables to analyze the teachers' perceptions. This enabled the researcher to describe the perceptions of the teachers using few numbers and charts. Mugenda and Mugenda (2003) indicate that the main purpose of descriptive statistics is to enable the researcher to meaningfully describe a distribution of scores using a few indices or statistics.

According to Orodho (2009), descriptive statistics enable researchers to simplify and present data in an organized and meaningful form. The author further adds that descriptive statistics enable researchers to use one or more numbers such as mean, variance and standard deviation to indicate the average score and the variability of scores of a sample. These techniques were found to be appropriate in addressing the research objectives of the present study.

In addition, Pearson's Product Moment Correlation Coefficient was used to correlate participants' perceptions on Braille literacy instruction with their gender, age and Braille teaching experience. Pearson correlation is examination of the relationship between two variables (Bryman & Cramer, 2009).

Finally, the thematic approach of data analysis was adopted to analyse and interpret the qualitative data that was obtained from the headteachers to address research objective seven in the study. Emerging themes were identified.

Thematic analysis is a method for identifying, analysing and reporting patterns or themes within the data (Braun & Clarke, 2006). It minimally organises and describes your data set in detail (Braun & Clarke 2006, p.79). The qualitative data was presented in a narrative form where the voices of the interviewees were captured in the analysis. This enabled the researcher to present the views of the respondents in a manner that demonstrated their feelings and perceptions on teaching Braille literacy in the special schools for learners with visual impairment in Kenya.

3.11 Logistical and Ethical Considerations

Logistics in research involves all the activities and actions that the researcher must undertake to ensure successful completion of the study. Before the researcher embarked on the study, an introduction letter to carry out research was sought from the Dean, School of Graduate Studies, Kenyatta University. This letter facilitated the acquisition of research permit from the Ministry of Education through National Council of Science and Technology.

Mugenda and Mugenda (2003) assert that it is advisable for researchers to obtain permit from appropriate authority before carrying out the study. In support of this view, Orodho (2009) intimates that it is advisable for researchers to request for an approval letter from designated institution or government department certifying that

the researcher has an approval to carry out the study. The respondents were assured of confidentiality by the researcher, thereby protecting the information given by the respondents. According to Mugenda and Mugenda (2003), lack of confidentiality and mishandling of information provided by respondents may cause them some physical or psychological harm. The instruments were administered to the participants individually with the help of research assistants. Additionally, participants were accorded the same treatment and informed on the purpose of the study and how its findings would be used to benefit learners with visual impairment.

It is highly unethical for researchers to fail to disclose the real purpose of the study fearing that the respondent may decline to participate in the study (Mugenda&Mugenda, 2003). The consent of all respondents was solicited and participants were required to sign the consent form which was attached to the questionnaire. Thus, participation in the study was voluntary and respondents who felt uncomfortable to participate in the study were allowed to exit. The right to privacy demands that direct consent for participation must be obtained from the participants (Orodho, 2009).

CHAPTER FOUR

FINDINGS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the findings, interpretation and discussion according to the research objectives. As stated in chapter one, the purpose of the study was to investigate and analyze teachers' perceptions on instruction of Braille literacy in special primary schools for learners with visual impairment in Kenya.

The objectives designed to guide the study were:-

1. To determine teachers' perceptions on factors influencing Braille literacy in schools for learners with visual impairment in Kenya;
2. To determine teachers' perceptions on phonological training and reading activities for young Braille learners in Kenya;
3. To examine teachers' perceptions on their professional preparation in Braille literacy instruction in Kenya;
4. To establish teachers' perceptions on teaching contracted and uncontracted English Braille code in schools for learners with visual impairment in Kenya;
5. To determine teachers' perceptions on provision of print and Braille literacy for learners with low vision in Kenya;
6. To find out teachers' perceptions on the use of Braille and assistive technology in teaching literacy skills to learners with visual impairment in Kenya;
7. To find out views and feelings of headteachers of schools for learners with visual impairment on the situation of Braille literacy instruction in their respective schools.

4.2 Demographic Information of the Teachers

This section presents general information on respondents' return rate and respondents' demographic details such as gender, age, teaching experience in schools for learners with visual impairment and academic qualification of the respondents.

4.2.1 Return Rate of the Teachers' Questionnaire

Questionnaires were administered to a sample of fifty-three (53) teachers in schools for learners with visual impairment from whom fifty-three (53) questionnaires were returned for analysis, giving a response rate of 100%. The high rate of returns by these respondents can be attributed to the teachers' concerns about the situation of Braille literacy in their schools and also to the fact that the completed questionnaires were collected on the same day.

4.2.2 Teachers' Demographic Information

The teachers' demographic information which includes level of education, designation and number of years in teaching Braille was established.

Table 4.1: Teachers' demographic information

Demographic information	Number of respondents (n	Percent
	= 53)	
Age (Years)		
26 – 35	12	22.6
36 – 45	22	41.5
46 – 55	19	35.8
Above 55	0	0.0
Gender of the respondents		
Male	20	37.7
Female	33	62.3
Highest level of education		
P1	3	5.7
Diploma	14	26.4
B. Ed Degree	31	58.5
M.Ed	5	9.4
Designation		
Senior teacher	2	3.8
Subject teacher	27	50.9
Classroom teacher	24	45.3

Table 4.1 shows that both male and female teachers were involved in the study. Female teachers were the majority of respondents accounting for nearly three-fifths, while the male teachers were the minority. Most of the teachers were aged between 36 to 55 years, the majority of whom were 36-45 accounting for two-fifths of the respondents. Nearly a quarter of the respondents ranged between 26 – 35 years.

Table 4.1 also indicates that majority of teachers had a Bachelor of education degree accounting for nearly three-fifths of the respondents. Nearly a quarter were diploma holders, followed by one-sixth who had a master's degree in special needs education. This study finding deviates from research findings of a study conducted by Njue (2009) in schools for learners with visual impairment. The study reported that only 57.14% of the teachers had a Diploma in special needs education, 14.28% Bachelor of education degree holders, while 28.57% had only taken a three months training. The difference between these two findings could be explained by the availability of various special needs degree programmes offered by public and private universities. The researcher established that learners with visual impairment in special primary schools are taught by highly qualified teachers.

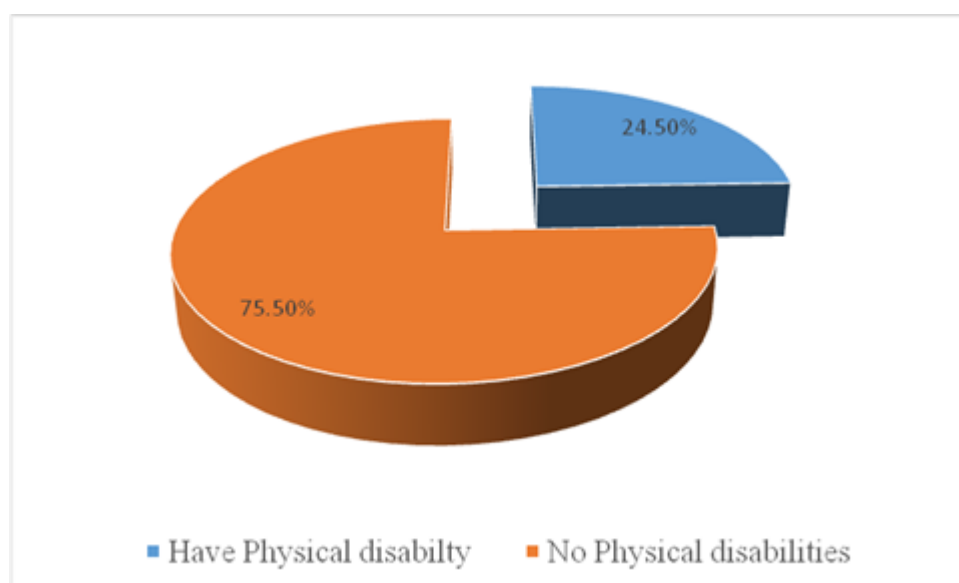


Figure 4.1: Teachers with disabilities

When the teachers were asked to indicate whether they had any disability, most of the teachers (75.5%) stated that they had no disability at all. Only 24.5% had one type of disability or the other. When they were requested to state the nature of disability, the results are as shown in Figure 4.2.

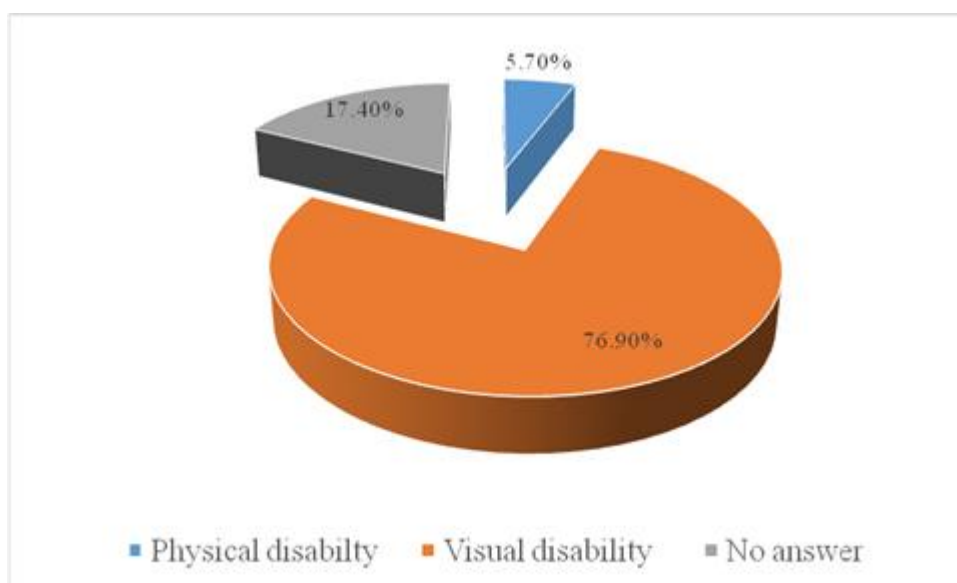


Figure 4.2: Nature of disability of the teachers

The main disability of the teachers was visual impairment (76.9%). Besides this disability, 5.7% of the teachers had physical disability, while 15.4% did not respond.

4.2.2.1 Teachers' Number of Years in Teaching Braille

Teachers stated the number of years they had been teaching Braille and the result was as shown in the figure 4.3.

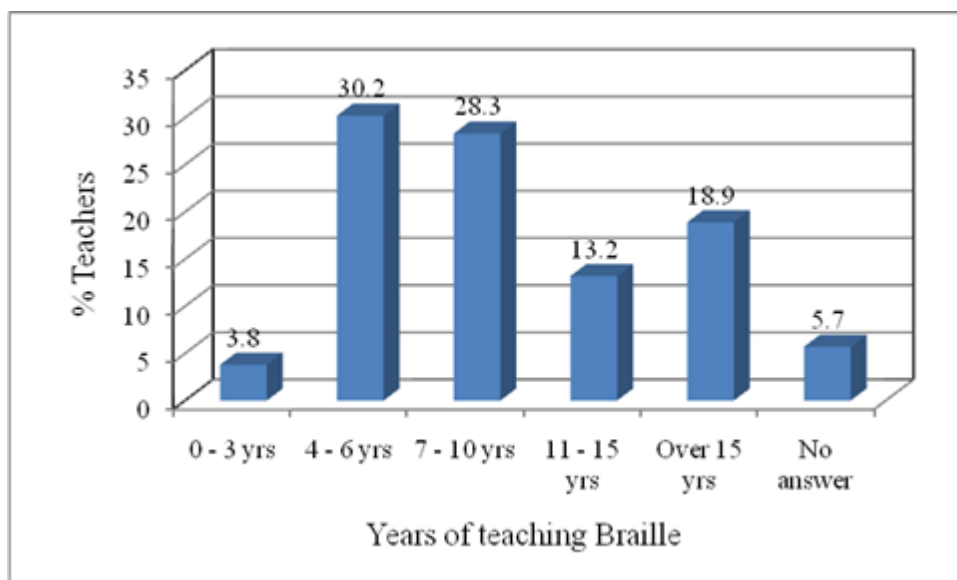


Figure 4.3: Number of years of teaching Braille

Figure 4.3 shows that nearly three-fifths of the teachers had taught Braille for a period between 4 and 10 years while a quarter had taught Braille for a period ranging from 11 – 15 years. The researcher found out that teachers in schools for learners with visual impairment had a reasonable Braille teaching experience.

4.3 Teachers' Perceptions on Factors Influencing Braille Literacy (Objective One)

The first task was to determine the teachers' perceptions on factors influencing Braille literacy in schools for learners with visual impairment. Subsequently, they were asked to indicate their perceptions on factors influencing Braille literacy instruction. The results are indicated in Table 4.2.

Table 4.2: Teachers' perceptions on factors influencing Braille instruction

Statement	SA	A	N	D	SD	Mean
Students Braille literacy skills have declined	19 (35.8%)	15 (28.3%)	4 (7.6%)	13 (24.5%)	2 (3.8%)	2.31

Nearly two-thirds of the teachers agreed that Braille literacy skills had declined in their schools while one-quarter of the teachers disagreed with the statement as shown in Table 4.2. Further, teachers were asked to indicate the most likely causes of Braille literacy decline in their schools. The results are indicated in Table 4.3.

Table 4.3: Teachers' perceptions on the decline in Braille literacy

Causes of decline	Number of teachers	Percent
Reliance on technology	24	45.3
Teacher attitudes	34	64.2
Increase in multiple disability population	39	73.6
Inadequate teacher preparation	36	67.9
Emphasis on vision utilization by learners with low vision	37	69.8
Complexity of Braille code	24	45.3
Teacher incompetence	31	58.5
Pupil teacher ratio	38	71.7

Table 4.3 indicates factors perceived by teachers as causes of Braille literacy decline in schools for learners with visual impairment. They were: increase in multiple disability population as the highest percentage followed by pupil-teacher ratio, emphasis on vision utilization by learners with low vision, inadequate teacher preparation, teacher

attitudes, teacher incompetence, complexity of Braille code and reliance on technology. These factors have had negative impact on instruction of Braille literacy.

Through an open-ended question in an item entitled (other), the researcher further sought teachers' own feelings regarding factors influencing instruction of Braille literacy in schools for learners with visual impairment. Their responses are indicated in Table 4.4.

Table 4.4: Teachers' own feelings regarding factors influencing Braille teaching

	Number of teachers	Percent
Inadequate teaching materials	31	70.5
Shortage of Braille books	37	84
Lack of commitment from teachers to learn Braille	22	52.3
Inadequate time allocation for Braille	19	43.2
Lack of Braille syllabus as a subject to be taught on the timetable	24	54.5
Lack of frequent refresher courses or seminars for teachers to update themselves	35	79.5
Poor or lack of motivation of teachers in teaching Braille	18	40.9
Teachers' failure to practice the use of Braille code	27	61.4

Table 4.4 represents a summary of responses from forty-four (44) teachers accounting for nearly 80% of the respondents. The study finding revealed that nearly seventeen out of twenty teachers (85%) felt that shortage of Braille books was a factor influencing instruction of Braille literacy in schools for learners with visual

impairment. Almost four-fifths (79.5%) of the respondents cited lack of frequent refresher courses or seminars for teachers to update themselves. Another factor was inadequate teaching materials indicated by the majority of the respondents. More than half of the respondents felt that teachers' failure to practise the use of Braille code (61.4%), lack of Braille syllabus as a subject to be taught on the timetable (54.5%) and lack of commitment from teachers to learn Braille (52.3%) also influenced instruction of Braille literacy in schools for learners with visual impairment. Further, the study findings established that most of the teachers in the schools are not committed to learn Braille. Very few of them are Braille proficient and cannot be said to be competent in Braille teaching.

These findings concur with previous studies done in this field, (NFB,2009), Nzoka 2011; Mugambi (2012). In his study, Nzoka (2011) established that teachers were not interested in learning Braille and demonstrated lack of Braille skills in guiding their learners. This is a clear indication of decline of Braille literacy in special primary schools. Mugambi (2012) pointed out that the quality of educating and training largely depends on the teachers' academic qualification, professional training, commitment and dedication. Schools can only be effective if teachers are professionally trained and continuously in-serviced to improve their knowledge, pedagogical skills and competency. On the other hand, Kimeto (2010) argues that lack of adequate number of trained personnel for pupils with visual impairment presents a challenge to reading and writing in Braille.

The study also established that students' Braille literacy skills had declined in the schools due to increase in multiple disability population. This finding is consistent with results of NFB study on decline of Braille literacy in the USA, 2009. It is the responsibility of the teacher to encourage the learners to develop positive attitude towards beginning Braille literacy and to discuss with them instances when Braille may be used on daily basis. As Mwangi (2009) rightly observes, quality Braille literacy will not only depend on the positive attitudes from the teacher, but also on teachers' education, availability of support materials, teacher-pupil ratio and workload.

4.4 Teachers' Perceptions on Phonological Training and Reading Activities for Young Children with Visual Impairment (Objective Two)

The second research question was to determine the perceptions of teachers on phonological training and reading activities for young children with visual impairment. Teachers were asked to indicate their perceptions on phonological training and reading activities for young Braille beginners. The results are indicated in Table 4.5.

Table 4.5: Teachers' perception on phonological training and reading for young Braille beginners

Statement	SA	A	N	D	SD	Mean
Braille is to the blind as print is to the sighted	27 (50.9%)	12 (22.6%)	1 (1.9%)	8 (15.1%)	5 (9.4%)	2.09
I enjoy learning and teaching Braille in my school	28 (52.8%)	13 (24.5%)	4 (7.5%)	7 (13.2%)	1 (1.9%)	1.87
The reading process of children with visual impairment is affected by limited opportunities for learning letters and words before joining school	29 (54.7%)	14 (26.4%)	2 (3.8%)	1 (1.9%)	7 (13.2%)	1.92
Ability to detect sounds in oral language and link them to Braille letters or words is critical for young Braille beginners	26 (49.1%)	19 (35.8%)	5 (9.4%)	2 (3.8%)	1 (1.9%)	1.69
We lack access to current resources on teaching early Braille literacy in schools	15 (28.3%)	25 (47.2%)	7 (13.2%)	5 (9.4%)	1 (1.9%)	2.09
I am not aware of methods and materials for teaching Braille to young children with visual impairment	7 (13.2%)	9 (17.0%)	4 (7.5%)	17 (32.1%)	16 (30.2%)	3.52
As a pre-Braille skill, training children with visual impairment to identify letters and words in oral language according to sounds is a major concern to schools	30 (56.6%)	15 (28.3%)	5 (9.4%)	3 (5.7%)	-	1.64
Young children with visual impairment need to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words	37 (69.8%)	14 (26.4%)	2 (3.8%)	-	-	1.31

From Table 4.5, the responses revealed that teachers' perceptions on phonological training and reading activities for young children with visual impairment were mainly that, young children with visual impairment needed to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words, with a mean of 1.31 in a scale of 1-5 (Strongly Agree -1, Agree-2, Neutral-3, Disagree- 4 and Strongly Disagree-5).

Out of 53 teachers, majority agreed that as a pre-Braille skill, training children with visual impairment to identify letters and words in oral language according to sounds is a major concern to schools. This accounted for nearly 85%. Nearly seven (7) out of ten (10) teachers strongly agreed while nearly a quarter agreed that young children with visual impairment need to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words whereas a third of the teachers disagreed and further a third strongly disagreed that they were not aware of methods and materials for teaching Braille to young children with visual impairment with a mean of 3.52.

Moreover, the study sought to establish teachers' perceptions on phonological training and reading activities for young Braille beginners in relation to the gender of the teachers. To establish the variation, a Pearson moment correlation matrix was computed. The relationship was computed in all the items on teacher's perception against the teacher's gender as shown in Table 4.6.

Table 4.6: Correlation matrix showing teachers' perception in relation to teachers' gender: N=53

Teachers perception items		Gender
Braille is to the blind as print is to the sighted.	Correlation (r – value)	-.059
	Sig. (2-tailed) p-value	.677
I enjoy learning and teaching Braille in my school.	Pearson (r – value)	-.056
	Sig. (2-tailed) p-value	.688
The reading process of children with visual impairment is affected by limited opportunities for learning letters and words before joining school.	Pearson (r – value)	.100
	Sig. (2-tailed) p-value	.476
Ability to detect sounds in oral language and link them to Braille letters or words (Phonological skills) is critical for young Braille beginners.	Pearson (r – value)	-.236
	Sig. (2-tailed) p-value	.095
	N	51
We lack access to current resources on teaching early Braille literacy in our schools.	Pearson (r – value)	-.005
	Sig. (2-tailed) p-value	.974
I am not aware of methods and materials for teaching Braille to young children with visual impairment.	Pearson (r – value)	.040
	Sig. (2-tailed) p-value	.785
As a pre-Braille skill, training children with visual impairment to identify letters and words in oral language according to sounds is a major concern in schools for learners with visual impairment today.	Pearson (r – value)	-.142
	Sig. (2-tailed) p-value	.312
Young children with visual impairment need to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words.	Pearson (r – value)	.012
	Sig. (2-tailed) p-value	.932
	N	52

Pearson moment correlation tested at $P \leq 0.05$

From Table 4.6, the study established that there was no significant relationship between teachers' perception on phonological training and reading activities for Braille beginners and their gender in all the tested items ($P > 0.05$). Further, the study sought to establish the teachers' perceptions on phonological training and reading activities for Braille beginners in relation to the duration of teachers' experience in Braille teaching.

Teachers' Perceptions on Phonological Training and Activities for Braille

Beginners in Relation to Teachers' Experience in Teaching Braille

To establish the relationship between the teachers' perception on phonological training and activities for Braille beginners and their experience in teaching Braille, a Pearson moment correlation matrix was computed. There was no relationship in all the tests items $P > 0.05$ as shown in Table 4.7.

Table 4.7: Correlation matrix showing teachers' perception in relation to teachers' Braille teaching experience

Teachers perception items		Number of years in teaching Braille
Number of years in teaching Braille	Pearson (r – value)	1
	Sig. (2-tailed)	.
	N	50
Braille is to the blind as print is to the sighted.	Pearson (r – value)	-.043
	Sig. (2-tailed) p-value	.766
	N	50
I enjoy learning and teaching Braille in my school.	Pearson (r – value)	-.232
	Sig. (2-tailed) p-value	.105
	N	50
The reading process of children with visual impairment is affected by limited opportunities for learning letters and words before joining school.	Pearson (r – value)	.112
	Sig. (2-tailed) p-value	.438
	N	50
Ability to detect sounds in oral language and link them to Braille letters or words (Phonological skills) is critical for young Braille beginners.	Pearson (r – value)	.076
	Sig. (2-tailed)	.606
	N	48
We lack access to current resources on teaching early Braille literacy in our schools.	Pearson (r – value)	.089
	Sig. (2-tailed) p-value	.538
	N	50
I am not aware of methods and materials for teaching Braille to young children with visual impairment.	Pearson (r – value)	-.015
	Sig. (2-tailed) p-value	.922
	N	47

As a pre-Braille skill, training children with visual impairment to identify letters and words in oral language according to sounds is a major concern in schools for learners with visual impairment today.	Pearson (r – value)	.177
	Sig. (2-tailed) p-value	.219
	N	50
Young children with visual impairment need to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words.	Pearson (r – value)	-.050
	Sig. (2-tailed) p-value	.735
	N	49

Further, the study sought to establish the teachers' perceptions on phonological training and reading activities in schools in relation to the age of the teacher. The relationship between the teacher's age and perception on phonological training and reading activities was established. A Pearson moment correlation matrix was computed in all the items as shown in Table 4.8.

Table 4.8: Correlation matrix showing teachers' perceptions in relation to their age

Teachers perception items		Age (years)
Braille is to the blind as print is to the sighted	Pearson (r – value)	.274(*)
	Sig. (2-tailed) p-value	.047
I enjoy learning and teaching Braille in my school	Pearson (r – value)	-.422(**)
	Sig. (2-tailed) p-value	.002
The reading process of children with visual impairment is affected by limited opportunities for learning letters and words before joining school	Pearson (r – value)	-.138
	Sig. (2-tailed)	.325
Ability to detect sounds in oral language and link them to Braille letters or words (Phonological skills) is critical for young Braille beginners	Pearson (r – value)	.131
	Sig. (2-tailed) p-value	.358
	N	51
We lack access to current resources on teaching early Braille literacy in our schools	Pearson (r – value)	.009
	Sig. (2-tailed) p-value	.951
I am not aware of methods and materials for teaching Braille to young children with visual impairment	Pearson (r – value)	.319(*)
	Sig. (2-tailed) p-value	.024
	N	50
As a pre-Braille skill, training children with visual impairment to identify letters and words in oral language according to sounds is a major concern in schools for learners with visual impairment today	Pearson (r – value)	.446(**)
	Sig. (2-tailed)	.001
Young children with visual impairment need to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words	Pearson (r – value)	-.024
	Sig. (2-tailed) p-value	.867
	N	52

* Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

From Table 4.8, the study showed that the teachers' age had effect on their perception towards phonological training and reading activities. Older teachers agreed that they enjoyed learning and teaching Braille in their schools ($r = 0.422$, $P = 0.002$) but they did not agree that as a pre-Braille skill, training children with visual impairment to identify letters and words in oral language according to sounds is a major concern in schools for learners with visual impairment today ($r = 0.446$, $P = 0.001$). Whereas, younger teachers revealed that Braille is to the blind as print is to the sighted ($r = 0.274$, $P = 0.047$). The younger teachers also agreed that they are not aware of methods and materials for teaching Braille to young children with visual impairment ($r = 0.319$, $P = 0.024$).

An item seeking to determine teachers' perceptions on phonological training and reading activities for young Braille learners was administered to fifty-three teachers in the sampled schools. Teachers' views on promotion of sound-letter and sound-word association skills with young children with visual impairment were established as shown in Table 4.9.

Table 4.9: Activities used by teachers to promote sound-letter and sound-word Association skills

Activities	Number of teachers	Percent
Singing and listening to songs	48	90.6
Nursery rhymes and chants	33	62.3
Playing with sounds in words (e.g. tongue twisters)	33	62.3
Playing word games with children to identify beginning sounds in words	33	62.3
Reading stories with interesting sounds/rhymes	31	58.5
Building knowledge of sound symbol associations in meaningful contexts	29	54.7
Pointing out particular sounds in words when reading a story book	28	52.8
Inventing words that rhyme with child's name	16	30.2

Table 4.9 shows that to promote sound-letter and sound-word association skills with young children with visual impairment, the teachers mainly use singing and listening to songs (90.6%). Teachers also used playing with sounds (62.3%), nursery rhymes (62.3%) and playing word games with children to identify beginning sounds in words (62.3%) and reading stories with interesting sounds/rhymes (58.5%) besides other activities.

The researcher noted that the most popular activities used by teachers to develop Braille literacy for young children with visual impairment were: singing and listening to songs, playing with sounds, nursery rhymes and playing word games.

This finding is consistent with results of a study conducted in the USA by Murphy, Hatton and Erickson (2008, p.136) which investigated strategies used to promote phonological awareness by teachers. These included:

“singing and listening to songs, nursery rhymes and chants; reading stories with interesting sounds/rhythms; building knowledge of sound-symbol associations in meaningful contexts and inventing words that rhyme with child’s name” (p. 140).

In the current study teachers reported that they were using these strategies for phonological training and development of Braille literacy for young children with visual impairment. However, they agreed that they were limited by lack of access to current resources on teaching literacy, implying that there was a need for the development of resources to address linguistic development skills for the learners. The findings of the study also support Steve, Mike and Graeme (2011) in their argument that teachers should focus on the development of activities with children who are visually impaired to promote their linguistic and Braille literacy development at an early age. Children who are blind need to be exposed to activities that encourage them to manipulate, detect and analyze the sounds in oral language and more importantly, to activities that are intended to help them make the link between these sounds and written Braille letters and words. What must be emphasized at this point is that, phonological training is critical to pre-Braille skills.

A critical stage in the development of linguistic skills occurs before the child starts formal schooling, although there is some evidence that children with visual impairment may have an early linguistic advantage over sighted children due to their

increased dependence on auditory discrimination, their relative lack of exposure to letters in written form may interfere with their ability to apply these skills to reading, (Steveet *al.*, 2011). As far as young pre-school children are concerned, Barlow-Brown and Connelly (2002) noted that children who are born blind do not receive exposure to environmental print and therefore do not generally learn to recognize written letters of the alphabet until they join school where they learn Braille.’ (p. 259).

Letter learning is a major contributor to the development of linguistic skills in children who are blind and these critical skills develop only after children who are blind experience a written form of language.

The researcher observed that more than half of the teachers reported that they were not aware of materials and methods for teaching young children with visual impairment in the ECD programmes. This is correct because currently, ECD training programmes for teachers of learners with visual impairment are non-existent. This was confirmed by an interview with headteachers of special primary schools for learners with visual impairment appearing in the latter part of this chapter. It was evident that young Braille beginners were not receiving much attention due to teachers’ lack of competency in teaching them Braille. Certainly, there is need for intervention in favour of young blind learners who need Braille as source of empowerment as much as their sighted counterparts need print.

With regards to the introduction of Braille letters, the researcher did not hesitate to suggest the following approach for teachers from personal experience:

ABKL
CXGE
HMPR
DITV
OUSY
FNWJZQ

The above approach to teaching Braille letters makes learning Braille easier for beginners and avoids confusion which they experience when learning the alphabet the way sighted children are taught to read print.

4.5 Perception of Teachers on their Professional Preparation (Objective Three)

The third task in this study was to determine perceptions of teachers on their professional preparation. Teachers were asked to indicate their perceptions on their professional preparation for teaching Braille literacy. The results are indicated in Table 4.10.

Table 4.10: Teachers' perception on their professional preparation to teach Braille

Items included	Number of respondents	Percent
Historical perspective of Braille	46	86.8
Braille readiness	38	71.7
Reading methodology	31	58.5
Instructional materials	34	64.2
Experience with Braille users	31	58.5
Transcription, proofreading, Braille knowledge and rules	44	83.0
Methodology in the teaching of Braille reading	31	58.5

This study revealed that the most commonly taught topics in Braille training curriculum were: Historical perspective of Braille, transcription and proofreading and Braille knowledge rules. Training in preparation of instructional materials and reading methodology came second. Another item sought to find out professional preparation of teachers in Braille literacy and the results are indicated in Table 4.11.

Table 4.11: Teachers' perception on their Braille proficiency

Preparation to teach Braille	Number of respondents	Percent
Proficiency with Perkins Braille	45	84.9
Proficiency with slate and stylus	30	56.6
Ability to read Braille	51	96.2
Knowledge of Braille reading methodology	33	62.3
Proficiency in the Nemeth code	7	13.2
Knowledge of assistive aids	31	58.5
Ability to develop teacher made materials for Braille instruction	40	75.5
Ability to write lesson plans	37	69.8

The study established that almost 90% of the respondents did not know anything about the Nemeth code. However, more than three quarters were able to read Braille, use the Perkins Braille and develop teacher-made materials for Braille instruction. Nearly three-fifths had acquired reading methodology whereas proficiency in using slate and stylus was one of the least skills acquired.

Out of 53 sampled teachers, about two-fifths of the teachers participated in Braille refresher courses/workshops, one-fifth participated in Braille literacy conferences while one-tenth had participated in online Braille courses.

The researcher therefore concluded that teachers rarely participated in development of the professional programmes as shown in Figure 4.4.

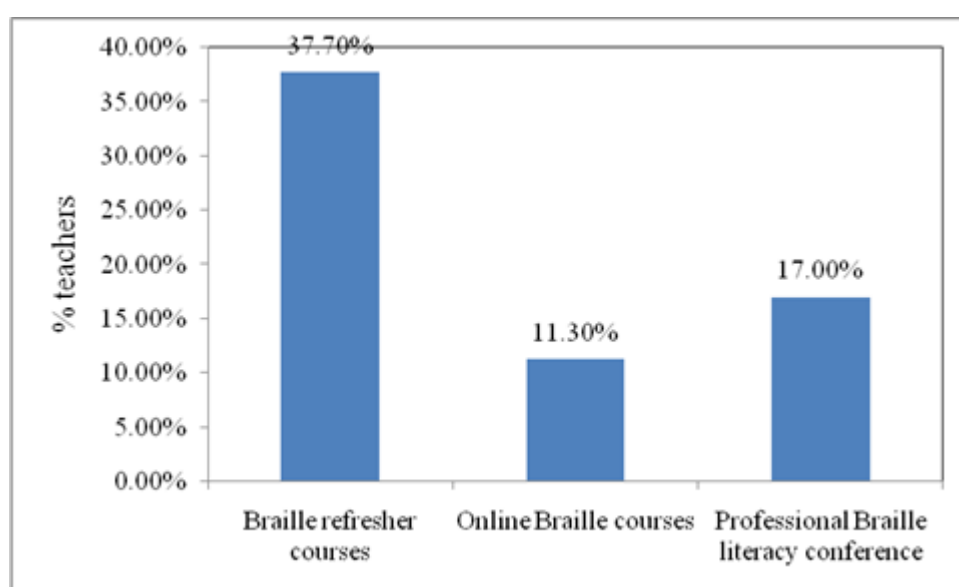


Figure 4.4: Teachers' participation in professional development programmes

4.5.1 Teachers' perceptions on their professional preparation in Braille literacy Instruction

Further, objective three sought to establish the teachers' perceptions on their professional preparation in Braille literacy instruction. An item seeking to determine teachers' perceptions on preparation in Braille literacy instruction was administered to fifty-three teachers in the sampled schools.

4.5.2 Teachers' Opinion after Completion of Braille Literacy Training

Teachers' views on their skills and ability to teach Braille after completion of their Braille training were established in a scale of 1 – 5 (1 – Strongly Agree, 2-Agree, 3-Neutral, 4-Disagree, 5-Strongly Disagree). The mean response on the teachers' responses on their professional preparation in Braille literacy instruction was analyzed as shown in Table 4.12.

Table 4.12: Teachers' opinion on profession preparation on Braille literacy instruction

Statement	SA	A	N	D	SD	Mean
Braille skills were satisfactory	16 (30.2%)	17 (32.1%)	5 (9.4%)	9 (17.0%)	6 (11.3%)	2.47
Teachers felt that their ability to teach Braille was satisfactory	10 (18.9%)	17 (32.1%)	7 (13.2%)	7 (13.2%)	12 (22.6%)	2.89
Currently feel that their Braille skills are not satisfactory	13 (24.5%)	12 (22.6%)	5 (9.4%)	15 (28.3%)	8 (15.1%)	2.87
Currently feel that their ability to teach Braille is not satisfactory	2 (3.8%)	14 (26.4%)	5 (9.4%)	21 (39.6%)	11 (20.8%)	3.47
Majority of teachers teaching visually impaired learners do not have satisfactory Braille skills	18 (34.0%)	8 (15.1%)	9 (17.0%)	9 (17.0%)	9 (17.0%)	2.68
Refresher training courses in Braille should be provided on a regular basis for teachers teaching learners with visual impairment	42 (79.2%)	9 (17.0%)	2 (3.8%)	-	-	1.25

SA-strongly agree, A-agree, N-Neutral, D-Disagree, SD- Strongly disagree

Out of the 53 sampled teachers, nearly four-fifths of the teachers strongly agreed and about one-sixth (17.0%) agreed that refresher training courses in Braille should be provided on a regular basis with a mean response of 1.25. Nearly one-third of the teachers agreed that Braille skills were satisfactory with a mean response of 2.47.

Almost half of the teachers agreed that majority of teachers teaching visually impaired learners did not have satisfactory Braille skills, with a mean response of 2.68. The study also established that the majority of teachers at the time felt that their Braille skills are not satisfactory, with a mean of 2.87 while about three-tenths (30.2%) felt that their ability to teach Braille was satisfactory.

Further, the study sought to establish the relationship between teachers' age and their views on professional preparation. A Pearson moment correlation matrix was computed. The relationship in all the items on teachers' opinions on professional preparation for Braille literacy instruction was computed against the teachers' age as shown in Table 4.13.

Table 4.13: Correlation matrix showing teachers' opinions on professional Preparation for Braille literacy in relation to teachers' age

Statement		Age (years)
When I completed my Braille training, I felt that my Braille skills were satisfactory	Pearson Correlation	-.262
	Sig. (2-tailed)	.058
	N	53
When I completed my Braille training, I felt that my ability to teach Braille was satisfactory	Pearson Correlation	-.626(**)
	Sig. (2-tailed)	.000
	N	53
I currently feel that my Braille skills are not satisfactory	Pearson Correlation	.552(**)
	Sig. (2-tailed)	.000
	N	52
I currently feel that my ability to teach Braille is not satisfactory	Pearson Correlation	.456(**)
	Sig. (2-tailed)	.001
	N	53
Majority of teachers teaching visually impaired learners do not have satisfactory Braille skills	Pearson Correlation	.404(**)
	Sig. (2-tailed)	.003
	N	53
Refresher training courses in Braille should be provided on a regular basis for teachers teaching learners with visual impairment	Pearson Correlation	.112
	Sig. (2-tailed)	.425
	N	53
Generally, students' Braille literacy skills have declined in our schools	Pearson Correlation	.498(**)
	Sig. (2-tailed)	.000
	N	52

The results revealed that older teachers felt that when they completed their Braille training, their ability to teach Braille was satisfactory ($r = 0.626$, $P = 0.001$). The older teachers also felt that currently their Braille skills are not satisfactory ($r = 0.552$, $P = 0.0001$). This category of teachers felt that their ability to teach Braille was not satisfactory ($r = 0.456$, $P = 0.001$) and that the majority of teachers for the visually impaired learners do not have satisfactory Braille skills.

Younger teachers agreed that students' Braille literacy skills have declined in their schools ($r = 0.498$, $P = 0.0001$). The study also sought to establish the teachers' opinions on professional preparation for Braille literacy in relation to their number of years in teaching Braille. The results are shown in Table 4.14.

Table 4.14: Correlation matrix showing teachers' opinions on professional Preparation in Braille literacy in relation to their experience

		Number of years in teaching Braille
When I completed my Braille training, I felt that my Braille skills were satisfactory	Pearson Correlation	.117
	Sig. (2-tailed)	.420
	N	50
When I completed my Braille training, I felt that my ability to teach Braille was satisfactory	Pearson Correlation	-.089
	Sig. (2-tailed)	.538
	N	50
I currently feel that my Braille skills are not satisfactory	Pearson Correlation	.298(*)
	Sig. (2-tailed)	.037
	N	49
I currently feel that my ability to teach Braille is not satisfactory	Pearson Correlation	.232
	Sig. (2-tailed)	.104
	N	50
Majority of teachers for the visually impaired learners do not have satisfactory Braille skills	Pearson Correlation	-.045
	Sig. (2-tailed)	.758
	N	50
Refresher training courses in Braille should be provided on a regular basis for teachers teaching learners with visual impairment	Pearson Correlation	.038
	Sig. (2-tailed)	.792
	N	50
Generally, students' Braille literacy skills have declined in our schools	Pearson Correlation	.132
	Sig. (2-tailed)	.365
	N	49

These findings are consistent with other studies reviewed in the literature for the current study: Nzoka (2011), Mugambi (2012), Lamb (1996), Allman (1998), Knowlton and Berger (1999) and Kimeto (2010). The study revealed that younger teachers agreed that their Braille skills are not satisfactory ($r = 0.298$, $P = 0.037$). The findings of the study also revealed that teachers are not adequately prepared on Braille literacy instruction. Lamb (1996) argues that the teaching of Braille literacy has been engrossed with physical perception skills and the mechanical aspects of reading by touch rather than as a language based skill. She also strongly supports the opinion that children who are learning to read and write using Braille need to be taught by teachers who are experienced Brailleists. According to Allman (1998), if teachers teaching students with visual impairment are expected to teach Braille and other related skills, they must learn these skills in their pre-service training. Knowlton and Berger (1999) add that teachers not only need to know Braille, but also to use the new computer technologies that enhance a teachers' ability to produce Braille materials.

The study also showed that Braille skills for both older and younger teachers were not satisfactory. This implies that their Braille skills are inadequate. They, therefore, cannot effectively instruct visually impaired learners. Further, younger teachers were in agreement that students' Braille literacy skills had declined in their schools. This is why Kimeto (2010) argues that lack of adequate number of trained personnel for pupils with visual impairment presents a challenge to reading and writing in Braille.

4.6 Teachers' Perceptions on Teaching Contracted and Uncontracted English BrailleCode in Schools for Learners with Visual Impairment (Objective Four)

The fourth research question was to determine teachers' perceptions on contracted and uncontracted Braille in schools for learners with visual impairment. Teachers were asked to indicate their perception on contracted and uncontracted Braille as used in their respective schools. The results are indicated as shown in Table 4.14. Using a scale of 1 – 5 (1 – strongly agree, 2 - agree, 3 - neutral, 4 - disagree, 5 - strongly disagree). This meant that test items strongly agreed with a mean of 1.00 while the item strongly disagreed had a mean of 5.00. The mean responses on the tested items were established as shown in Table 4.15.

Table 4.15: Teachers' perception on teaching contracted and uncontracted English Braille code

Statement	SA	A	N	D	SD	Mean
I prefer teaching English grade 1 Braille to English Grade 2 Braille	17 (32.1%)	12 (22.6%)	5 (9.4%)	8 (15.1%)	11 (20.8%)	2.70
I can teach English Braille Grade 1 and English Braille Grade 2 very well	18 (34.0%)	17 (32.1%)	5 (9.4%)	7 (13.2%)	6 (11.3%)	2.36
Braille should be taught only by teachers with visual impairment in schools for the visually impaired	11 (20.8%)	5 (9.4%)	2 (3.8%)	11 (20.8%)	24 (45.3%)	3.62
Braille construction affect the learners' reading fluency, spelling and efficiency of hand movement when reading	9 (17.0%)	18 (34.0%)	3 (5.7%)	8 (15.1%)	15 (28.3%)	3.04
Children who use contracted Braille are better spellers and faster readers than children who read English Braille grade 1	16 (30.2%)	20 (37.7%)	6 (11.3%)	4 (7.5%)	7 (13.2%)	2.36

SA-strongly agree, A-agree, N-Neutral, D-Disagree, SD- Strongly disagree

Out of 53 sampled teachers, two-thirds of the teachers (67%) revealed that they could teach English Braille Grade 1 and English Braille Grade 2 very well. A similar number of the teachers also revealed that children who use contracted Braille are better spellers and faster readers than children who read English Braille Grade 1. Slightly half of them preferred teaching English Grade 1 Braille to English Grade 2 Braille. Majority of the teachers felt that Braille should not be taught only by teachers with visual impairment in schools for learners with visual impairment.

Further, the study sought to establish teachers' perceptions on teaching contracted and uncontracted English Braille code in schools in relation to the age of the teachers. The relationship between teachers' perception on teaching Braille and the age of the teacher was computed in all the items as shown in Table 4.16.

Table 4.16: Correlation matrix showing teachers' perceptions on teaching contracted and uncontracted English Braille in relation to teacher's age: N=53

Teachers' perception items		Age (Years)
I prefer teaching English grade 1 Braille to English grade 2 Braille	Pearson (r – value)	.277(*)
	Sig. (2-tailed) p-value	.045
I can teach English Braille grade 1 and English Braille grade 2 very well	Pearson (r – value)	-.285(*)
	Sig. (2-tailed) p-value	.038
I feel that Braille should be taught only by teachers with visual impairment in schools for learners with visual impairment	Pearson (r – value)	.560(**)
	Sig. (2-tailed) p-value	.000
	N	52
Braille contractions affect the learners' reading fluency, spelling and efficiency of hand movements when reading	Pearson (r – value)	.144
	Sig. (2-tailed) p-value	.303
Children who use contracted Braille are better spellers and faster readers than children who read English Braille grade 1	Pearson (r – value)	.216
	Sig. (2-tailed) p-value	.121

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

The correlation revealed that teachers who were advanced in age felt that Braille should be taught only by teachers with visual impairment in schools for learners with visual impairment ($r = 0.560$, $P < 0.001$). These older teachers preferred teaching English grade 1 Braille to English grade 2 Braille ($r = 0.277$, $P = 0.045$). Younger teachers indicated that they could not teach English Braille grade 1 and English Braille grade 2 very well ($r = 0.285$, $P = 0.038$).

4.6.1 Teachers' Perceptions on Teaching Contracted and contracted English BrailleCode in Schools in Relation to the Number of Years in Teaching Braille

The study further sought to establish the teachers' perceptions on teaching contracted and uncontracted English Braille code in schools in relation to their Braille teaching experience. The results revealed that the relationship between the teachers' number of years in teaching Braille and the teachers' perceptions on the teaching of contracted and uncontracted English Braille showed that those who had less years agreed that they could not teach English Braille grade 1 and English Braille grade 2 very well ($r = 0.288, P = 0.042$) as shown in Table 4.17.

Table 4.17: Correlation matrix showing teachers' perception on teaching contracted and uncontracted English Braille in relation to teachers' Braille teaching experience

Items		Number of years in teaching Braille
I prefer teaching English grade 1 Braille to English grade 2 Braille	Pearson (r – value)	.137
	Sig. (2-tailed) p-value	.344
	N	50
I can teach English Braille grade 1 and English Braille grade 2 very well	Pearson (r – value)	-.288(*)
	Sig. (2-tailed) p-value	.042
	N	50
I feel that Braille should be taught only by teachers with visual impairment in schools for learners with visual impairment	Pearson (r – value)	.266
	Sig. (2-tailed) p-value	.065
	N	49
Braille contractions affect the learners' reading fluency, spelling and efficiency of hand movements when reading	Pearson (r – value)	.069
	Sig. (2-tailed) p-value	.633
	N	50
Children who use contracted Braille are better spellers and faster readers than children who read English Braille grade 1	Pearson (r – value)	-.070
	Sig. (2-tailed) p-value	.630
	N	50

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

It is generally believed that contracted Braille not only enables Braille readers to process information faster but also enhances ability to take in large amounts of text at a time (Emerson, et al., 2009). Contracted Braille can also avoid the teaching of familiar words in both Grade One and Grade Two Braille.

The findings of the present study revealed that teachers who were advanced in age felt that Braille should be taught only by teachers with visual impairment in schools for learners with visual impairment. This is contrary to Rex (1994) who contends that Braille must be taught by teachers who understand both the mechanisms of reading by touch and the additional challenges posed by the Braille code. Rex maintains that without this knowledge there may be a risk of attributing reading errors to a child's literacy difficulties rather than to incorrect finger positioning.

The study also established that older teachers preferred teaching English grade 1 Braille to English grade 2 Braille while younger teachers could not teach English Braille grade 1 and English Braille grade 2 very well. The findings of this study are consistent with other studies reviewed in the literature (Emerson, et al., 2009; Hong & Erin, 2004; Clunies-Ross; 2005, Steve, et al., 2011; Wright, Wormsley & Kannei-Hannan, 2009).

The study revealed that the relationship between the teachers' Braille teaching experience and the teachers' perceptions on their teaching contracted and uncontracted English Braille indicated that those who had less years in teaching Braille agreed that they could not teach English Braille grade 1 and English Braille grade 2 very well. The research also established that headteachers could write, read and teach English Braille especially grade 1 confidently while experiencing difficulty in reading grade 2.

This is why Wittenstein and Pardee (1996) emphasized that teaching programmes should focus on the teaching of reading and writing Braille and producte teachers who are more competent in their own Braille skills, as well as in their ability to convey knowledge to the students with visual impairment. Further, the findings of this study regarding perceptions of teachers on spelling ability, reading accuracy, reading speed and comprehension with regards to contracted English Braille code are in agreement with Hong and Erin's (2004) study which established that there were no significant differences found in performance over a variety of skills, such as comprehension, reading accuracy, reading speed and spelling ability, between first instructions in the two types of Braille nor was there any evidence that 'changing to contracted Braille later in school would impede the speed and efficiency of reading.

Clunies-Ross(2005) established that in Scandinavia, the policy of producing all materials in uncontracted Braille has increased the number of users and made production more economically viable. She concluded that "the place of uncontracted Braille is growing within the range of options on offer to blind readers" and suggested that "new groups such as very young learners, those in mainstream education, older learners, children with learning difficulties, those who are adventitiously blind, and people for whom English is a second language are finding it easier to learn" (p. 72), thus the popularity of uncontracted Braille is fast gaining currency. A five year longitudinal ABC Braille Study ('Alphabetic Braille and Contracted' Braille), followed the progress of 42 children in Canada and the USA who were introduced to literacy through Braille (Emerson et al., 2009). Children's teachers had settled for

their approach at the start of the study as ‘contracted’ or ‘uncontracted’.

The study indicated that students who were reading primarily uncontracted Braille were reading at much lower levels and demonstrating worse vocabulary and spelling skills’ (Emerson *et al.*, 2009, p620) than the children in the high contractivity group. The children who were introduced to more contractions earlier in instruction performed better on virtually all reading measures including decoding, vocabulary, and comprehension and the use of contractions did not seem to affect their fluency in oral reading (Emerson *et al.*, 2009).The results of the present study support these findings.

In the review of the literature on the role played by hand movements in Braille reading, Wright, WormsleyandKannei-Hannan (2009) concluded that there was no evidence that the introduction of contractions had any significant effect on hand movement patterns or characteristics. Nor is there evidence from the literature in support of the view that the introduction of the additional complexity of contractions has a negative effect, hence making hand movements less efficient for Braille beginners. There is also no evidence to support the view that uncontracted Braille improves efficiency of hand movements (Steve *et al.*, 2011).

The findings of this study lead to the conclusion that although some teachers and supporters of uncontracted Braille criticize contracted Braille on the basis that contractions have an adverse effect on reading fluency, efficiency of hand movements or spelling when reading are essential. Steve,*et al.*, (2011) argue that there is no

evidence that uncontracted Braille has significant benefits in reducing pauses, regressions or scrubbing in Braille readers. Further, they maintain that use of contractions does not seem to affect fluency in oral reading and there is no clear evidence that children who use contracted Braille are likely to be poorer spellers than children who use uncontracted Braille.

4.7 Teachers' Perceptions on Provision of Print and Braille Literacy to Learners With Low Vision (Objective Five)

Objective five of the study sought to establish teachers' perceptions on provision of print and Braille literacy to learners with low vision. Teachers were asked to rate their perceptions on provision of print and Braille literacy to learners with low vision. Their perceptions were rated on a scale of 1 – 5 (1 – Strongly Agree, 2 - Agree, 3 - Neutral, 4 - Disagree, 5 - Strongly Disagree). The mean response on the tested items indicated that strongly agreed had a mean of 1.00, whereas strongly disagreed had a mean of 5.00 as indicated in Table 4.18.

Table 4.18: Perceptions on provision of print and Braille literacy to learners with low vision

Statement	SA	A	N	D	SD	Mean
Teaching Braille literacy to learners with low vision is a wastage of time and effort	9 (17.0%)	4 (7.5%)	4 (7.5%)	21 (39.6%)	15 (28.3%)	3.55
Teachers provide Braille as an alternative medium for children who are experiencing progressive loss of vision	24 (45.3%)	17 (32.1%)	1 (1.9%)	5 (9.4%)	6 (11.3%)	2.08
Learners with low vision should be taught both Braille and print reading and writing (dual media) regardless of how good their vision is	26 (49.1%)	15 (28.3%)	-	7 (13.2%)	5 (9.4%)	2.06
A learner with low vision has the right to choose whether he/she prefers reading and writing in Braille, print or a combination of both print and Braille (Dual media)	14 (26.4%)	19 (35.8%)	4 (7.5%)	12 (22.6%)	4 (7.5%)	2.49
Learners with low vision in the schools are not exposed to Braille literacy, but learn Braille on their own from their peers	18 (34.0%)	20 (37.7%)	3 (5.7%)	5 (9.4%)	7 (13.2%)	2.30
Teaching both Braille and print reading and writing has positive advantage for some learners with low vision	29 (54.7%)	18 (34.0%)	-	6 (11.3%)	-	1.68
We do not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print	23 (43.4%)	13 (24.5%)	2 (3.8%)	13 (24.5%)	2 (3.8%)	2.21
Confident in ability to make decisions concerning students learning media	15 (28.3%)	13 (24.5%)	10 (18.9%)	5 (9.4%)	10 (18.9%)	2.65
Legislation requiring the teaching of Braille to all children requested by their parents is a good idea	14 (26.4%)	28 (52.8%)	4 (7.5%)	6 (11.3%)	1 (1.9%)	2.09
Decision about students learning media should be an IEP committees' decision	13 (24.5%)	21 (39.6%)	6 (11.3%)	7 (13.2%)	6 (11.3%)	2.47

SA-strongly agree, A-agree, N-Neutral, D-Disagree, SD- Strongly disagree

The findings of this study established that teachers believed that teaching both Braille and print reading and writing has a positive advantage for some learners with low vision, with a mean response of 1.68. They are consistent with findings of Lusk and Corn (2006b) who established that a single-medium policy was common in the United States in the 1970s but currently, dual media is regarded as a positive advantage for some children. Lusk and Corn (2006b) found that there was generally positive attitude towards both print and Braille among the students and the most common factor in teachers' decision to introduce dual media instruction was a major concern among teachers and parents, owing to the progressive nature of the child's eye condition. Teachers strongly supported the statement that learners with low vision should be taught both Braille and print reading and writing (dual media) regardless of how good their vision is with the mean response of 2.06.

However, less than twenty five percent(25%) of the respondents held a contrary opinion. The study also established that teachers provided Braille as an alternative medium for children who are experiencing progressive loss of vision, with a mean of 2.08. The statement was supported by nearly 80% of the respondents. When teachers were asked whether legislation requiring the teaching of Braille to all children requested by their parents is a good idea, they affirmed the statement with a mean response of 2.09.

The researcher established that schools for learners with visual impairment do not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print with a mean of 2.21. This finding raises a legitimate concern in the education of learners with visual impairment in the sampled schools because continued appropriateness of the child's literacy medium should be assessed and determined on regular basis.

As a matter of fact, accurate assessment of literacy performance is important in informing literacy teaching because assessment provides teachers with an insight into pupils' progress and the particular problems they may be experiencing. This applies to the teaching of literacy through Braille as it does to teaching literacy through print. Without such assessment tools, teachers in schools cannot arrive at decisions about appropriate literacy media for children with visual impairment (Steve,*et al.*, 2011).

4.7.1 Teachers' Perception on Provision of Print and Braille Literacy for Learners with Low Vision in Relation to Age of the Teacher

The study also sought to establish the perceptions of teachers on provision of print and Braille literacy for learners with low vision in relation to teacher's age. The views were established using Pearson Correlation matrix as shown in Table 4.19.

Table 4.19: Correlation matrix showing teachers' perceptions on provision of print and Braille in relation to the age of the teacher: N=53

Items		Age (years)
Teaching Braille literacy to learners with low vision is a waste of time and effort	Pearson (r-value)	.430(**)
	Sig. (2-tailed)	.001
Teachers provide Braille as an alternative medium for children who are experiencing progressive vision loss	Pearson (r-value)	-.434(**)
	Sig. (2-tailed)	.001
	N	52
learners with low vision should be taught both Braille and print reading and writing (dual media) regardless of how good their vision is	Pearson (r-value)	-.246
	Sig. (2-tailed)	.076
A learner with low vision has the right to choose whether he/she prefers reading and writing in Braille, print or a combination of both print and Braille (dual media)	Pearson (r-value)	.146
	Sig. (2-tailed)	.297
Learners with low vision in our schools are not exposed to Braille literacy, but learn Braille on their own from their peers	Pearson Correlation	.401(**)
	Sig. (2-tailed)	.003
Teaching both Braille and print reading and writing has a positive advantage for some learners with low vision	Pearson (r-value)	-.284(*)
	Sig. (2-tailed)	.039
We do not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through combination of Braille and print	Pearson (r-value)	.446(**)
	Sig. (2-tailed)	.001
I am confident in my ability to make decisions concerning my students learning media	Pearson (r-value)	-.394(**)
	Sig. (2-tailed)	.004
	N	51
Legislation requiring the teaching of Braille to all children with low vision when requested by their parents is a good idea	Pearson (r-value)	.163
	Sig. (2-tailed)	.245
	N	53
Decisions about students learning media should be an IEP committee's decision	Pearson (r-value)	-.006
	Sig. (2-tailed)	.967

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

The results indicated that teachers who were older provided Braille as an alternative medium for children who are experiencing progressive loss of vision ($r = 0.434$, $P = 0.001$), older teachers were confident in their ability to make decisions concerning their students learning media ($r = 0.394$, $P = 0.004$) and felt that teaching both Braille and print reading and writing has a positive advantage for some learners with low vision ($r = 0.284$, $P = 0.039$). Younger teachers felt that learners with low vision in their schools are not exposed to Braille literacy, but learn Braille on their own from their peers ($r = 0.401$, $P = 0.003$). This category of teachers also felt that they did not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print ($r = 0.446$, $P = 0.001$).

4.7.2 Perception of Teachers on Provision of Print and Braille Literacy for Learners with Low Vision in Relation to Teachers' Braille Teaching Experience

Further, the study sought to establish the perception of teachers on the provision of print and Braille literacy for learners with low vision in relation to Braille teaching experience. Teachers were asked to indicate their perceptions and the results are shown in Table 4.20.

Table 4.20: Correlation matrix showing teachers' perceptions on provision of print and Braille in relation to Braille teaching experience

Items		Number of years in teaching Braille
Teaching Braille literacy to learners with low vision is a wastage of time and effort	Pearson (r-value)	.164
	Sig. (2-tailed)	.256
	N	50
Teachers provide Braille as an alternative medium for children who are experiencing progressive vision loss	Pearson (r-value)	-.074
	Sig. (2-tailed)	.615
	N	49
Learners with low vision should be taught both Braille and print reading and writing (dual media) regardless of how good their vision is	Pearson (r-value)	-.059
	Sig. (2-tailed)	.685
	N	50
A learner with low vision has the right to choose whether he/she prefers reading and writing in Braille, print or a combination of both print and Braille (dual media)	Pearson (r-value)	.094
	Sig. (2-tailed)	.518
	N	50
Learners with low vision in our schools are not exposed to Braille literacy, but learn Braille on their own from their peers	Pearson (r-value)	.033
	Sig. (2-tailed)	.819
	N	50
Teaching both Braille and print reading and writing has a positive advantage for some learners with low vision	Pearson (r-value)	-.202
	Sig. (2-tailed)	.159
	N	50
We do not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print	Pearson (r-value)	.281(*)
	Sig. (2-tailed)	.048
	N	50
I am confident in my ability to make decisions concerning my students learning media	Pearson (r-value)	-.065
	Sig. (2-tailed)	.663
	N	48
Legislation requiring the teaching of Braille to all children with low vision when requested by their parents is a good idea	Pearson (r-value)	.039
	Sig. (2-tailed)	.790
	N	50
Decisions about students learning media should be an IEP committee's decision	Pearson (r-value)	-.121
	Sig. (2-tailed)	.404
	N	50

* Correlation is significant at the 0.05 level (2-tailed).

The results of the study revealed that teachers who had taught Braille for a shorter time reported that they did not have a standardized assessment tool developed to help them determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print ($r = 0.281$, $P = 0.048$). However, Lusk and Corn (2006) are of the view that while reading speed should not be the only requirement, it is important for children to develop a 'functional and competitive reading speed in either print or Braille' (p. 655). The study also established that teachers who were older provided Braille as an alternative medium for children who were experiencing progressive loss of vision. Younger teachers felt that they did not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print.

Koenig and Holbrook (1995), designed the Learning Media Assessment (LMA) procedure to help teachers determine whether children should receive literacy instruction through a combination of Braille and print (dual media), Braille or through print and stressed that the results of the LMA should not be regarded as the only decision but recommended that the continued appropriateness of the child's literacy medium should be assessed and determined on regular basis. Further, the results of the study showed that teachers who had taught Braille for a shorter time reported that they do not have a standardized assessment tool developed to help them determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print. The study concurs with Rogers (2007) study that found that dual media users did not use Braille and print in equal amounts.

4.8 Teachers' Perceptions on the Use of Braille and Assistive Technology in Teaching Literacy Skills (Objective Six)

Objective six of the study sought to investigate teachers' perceptions on the use of Braille and assistive technology in teaching literacy skills to learners with visual impairment. Using the Likert scale (1-5), teachers were asked to indicate their perception on the simultaneous use of Braille and assistive technology in teaching literacy skills to learners with visual impairment and the results are shown in Table 4.21.

Table 4.21: Teachers' perception on Braille and assistive technology

Statement	SA	A	N	D	SD	Mean
Technological devices should be used to enhance Braille, not to replace it	39 (73.6%)	13 (24.5%)	1 (1.9%)	-	-	1.25
Braille and technology should be taught to children with visual impairment in schools	31 (58.5%)	21 (39.6%)	1 (1.9%)	-	-	1.40
Digital technology will open up access to vast print and Braille materials in many academic subjects	36 (67.9%)	14 (26.4%)	1 (1.9%)	2 (3.8%)	-	1.38
Advances in digital technology have reduced the relevance of Braille	10 (18.9%)	4 (7.5%)	10 (18.9%)	17 (32.1%)	12 (22.6%)	3.33
Computer technology has an adverse effect on the development of Braille literacy	5 (9.4%)	21 (39.6%)	8 (15.1%)	14 (26.4%)	5 (9.4%)	2.87
Braille is not an important learning medium in the face of new information technology era.	11 (20.8%)	3 (5.7%)	2 (3.8%)	17 (32.1%)	19 (35.8%)	3.58
The computer technology will make Braille unnecessary	13 (24.5%)	7 (13.2%)	3 (5.7%)	18 (34.0%)	11 (20.8%)	3.13

SA-strongly agree, A-agree, N-Neutral, D-Disagree, SD- Strongly disagree

Out of the 53 sampled teachers, the majority (73.6%) of the teachers revealed that technological devices should be used to enhance Braille, not to replace it, with a mean response of 1.25. Two-thirds (67.9%) of the teachers believed that digital technology will open up access to vast print and Braille materials in many academic subjects, with a mean response of 1.38. The same number (67.9%) of the teachers agreed that Braille is an important learning medium in the face of new information technology era. Almost three-fifths (58.5%) felt that Braille and technology should be taught to children with visual impairment in schools, with a mean response of 1.40. Further, the researcher sought to find out the teachers' perception on the use of Braille and assistive technology in teaching literacy skills in relation to teacher's age as shown in Table 4.22.

Table 4.22: Correlation analysis showing teachers' perceptions on the use of Braille and assistive technology

Statement		Age (Years)
Technological devices should be used to enhance Braille, not to replace it	Pearson Correlation	.030
	Sig. (2-tailed)	.835
	N	52
Braille and technology should be taught to children with visual impairment in school	Pearson Correlation	-.231
	Sig. (2-tailed)	.100
	N	52
Digital technology will open up access to vast print and Braille materials in many academic subjects	Pearson Correlation	.138
	Sig. (2-tailed)	.328
	N	52
Advances in digital technology have reduced the relevance of Braille	Pearson Correlation	.219
	Sig. (2-tailed)	.119
	N	52
Computer technology has an adverse effect on the development of Braille literacy	Pearson Correlation	.275(*)
	Sig. (2-tailed)	.049
	N	52

When the teachers' opinions on the use of Braille and assistive technology in teaching literacy skills were subjected to a correlation analysis against the teacher's age, the results revealed that younger teachers agreed that computer technology has an adverse effect on the development of Braille literacy ($r = 0.275$, $P = 0.049$). Secondly, the correlation matrix on the teachers' perceptions on the use of Braille and assistive technology in teaching literacy skills in relation to teachers' experience in teaching Braille was computed as shown in Table 4.23.

Table 4.23: Correlation matrix on teachers' perceptions on the use of Braille and Assistive technology in teaching literacy skills in relation to Braille Teaching experience

Statement		Number of years in teaching Braille
Technological devices should be used to enhance Braille, not to replace it	Pearson Correlation Sig. (2-tailed) N	.066 .650 49
Braille and technology should be taught to children with visual impairment in school	Pearson Correlation Sig. (2-tailed) N	-.212 .143 49
Digital technology will open up access to vast print and Braille materials in many academic subjects	Pearson Correlation Sig. (2-tailed) N	.300(*) .036 49
Advances in digital technology have reduced the relevance of Braille	Pearson Correlation Sig. (2-tailed) N	.104 .477 49
Computer technology has an adverse effect on the development of Braille literacy	Pearson Correlation Sig. (2-tailed) N	.088 .546 49

The correlation analysis revealed that teachers who had taught Braille for many years disagreed that digital technology will open up access to vast print and Braille materials in many academic subjects ($r = 0.300$, $P = 0.036$). The findings of the current study established that technological devices should be used to enhance Braille, not to replace it, with a mean response of 1.25. This concurs with Presley and D'Andrea (2008) who noted that children with visual impairment need to be able to use a combination of technological tools to accomplish literacy tasks in both printed and electronic form. They describe a technology practice that begins with low tech tools, moving to increasingly higher tech tools as children's skills increase with age.

The study also revealed that younger teachers disagreed that computer technology has an adverse effect on the development of Braille literacy. This concurs with Steve, et al., (2011) who emphasized the essence of children who are blind acquiring access to technology that will facilitate flexible access through both touch and hearing. Digital technology has great potential in opening up access to learning materials in Braille and enhancing more flexible access through Braille to key academic areas.

The findings further indicated that teachers who had more years teaching Braille disagreed that digital technology would open up access to vast print and Braille materials in many academic subjects. However, according to Zhou, Parker, Smith and Griffen-Shirley (2011), the lack of skills and knowledge by teachers teaching pupils with visual impairment is the main barrier hindering the use of technology in school.

The empirical literature in relation to the interaction between digital technology and the teaching of literacy through Braille appears to be underdeveloped. However, there is no evidence in the research literature to support the view that technology has an adverse effect on the developments of literacy through Braille. It is also difficult to find a convincing argument to support the view that developments in technology will make it hard for teachers to embrace instruction through assistive technology to the disadvantage of Braille instruction.

The study findings are consistent with those of Wittenstein and Pardee (1996) who indicated that most teachers teaching blind students agreed that technology should be used as a supplement to Braille rather than as a replacement, even though most of them spend more instructional time working with technology than teaching Braille. The research established that headteachers supported the view of simultaneous use of Braille and technology in teaching literacy to learners with visual impairment in schools. This implies that the availability of text-to-speech technology and audio texts should not be advanced as an argument against the use of Braille. Rather, advances in technology have made Braille more available than it was in the past.

Computer software can now translate any document into literary, contracted Braille quickly and accurately, although work still needs to be done to make other Braille codes translatable by Braille displays and embossers (NFB, 2009). A variety of Braille books is available from Internet-based services like the Web-Braille service offered by the National Library Service for the Blind and Physically Handicapped of the Library of Congress (NLS) and the online community Bookshare.org.

In fact, while scarcity of Braille is still a problem, it is not as bad as it has been in the past. With the improvements of Braille production methods and technology, more Braille will be available for children, youth and adults with visual impairment.

4.9 Analysis of Teachers' Suggestions / Recommendations

The researcher asked teachers to respond to an open-ended question which sought their suggestions on the following areas related to literacy of learners with visual impairment.

These were:

- Braille training curriculum;
- Students' characteristics for Braille learning; and
- Educational service delivery

Out of fifty-three (53) teachers participating in the study, forty (40) teachers responded to the open-ended question accounting for 75.5%. In the opinion of the researcher, teachers responded favorably and gave very useful suggestions and comments which he analyzed and summarized as indicated in Table 4.24.

Table 4.24: Teacher's suggestions on Braille training curriculum, students' characteristics on Braille learning and educational service delivery

	Teachers	Percent
There should be workshops for teachers dealing with learners with visual impairment to equip them with proper Braille skills for efficient delivery in class	22	55
Teachers should study special needs education in teacher training colleges	28	70
The pupil teacher ratio for learners who are blind should be 1:10	30	75
Braille should be taught as a method course in the university and thereafter, every teacher teaching the visually impaired (V.I) should obtain a national Braille certificate after sitting an exam administered by the Kenya National Examinations Council	24	60
Teachers should be involved in all aspects of teaching the VI learners including teaching methodology, materials development and review, development of evaluation tools and learning resources.	33	82.5
Qualified personnel in the area of V.I (Braille literacy) should be available at Jogoo house.	27	67.5
Establishment of workshops for manufacturing assistive devices for visually impaired	22	55
Provision of refresher courses in Braille on a regular basis for teachers of learners with visual impairment	35	87.5
Learners should be encouraged to develop positive attitude towards Braille as a mode of learning	32	80
There should be qualified teachers for young blind learners in ECD programmes.	34	85
Emphasis on methods and activities for teaching pre-Braille reading skills as the foundation for reading Braille	31	77.5
Standardized assessment tools should be developed to determine the category of the learner in schools	25	62.5
KICD should develop a full Braille curriculum to be taught as an examinable subject for our learners.	28	70
Teachers Service Commission (TSC) should insist on deploying teachers who are certified as teachers for the V.I by the KNEC after passing Braille exams.	22	55

The results in Table 4.24 are consistent with findings of other studies reviewed in the literature for the current study: Amato (2002); Hui-Yu Hung (2008); Mwangi (2009); NFB (2009); Nzoka (2011); Bindman and Greenaway (2011). For example, Amato (2002) in a descriptive study of standards and criteria for competency in Braille literacy within teacher preparation programs recommends a comprehensive look at the content of teacher preparation programmes relevant to Braille literacy and makes recommendations aimed at assisting the specialists to develop teacher preparation courses which provide comprehensive knowledge and skill development in the area of literacy.

Teachers' recommendations support NFB (2009) findings on factors affecting Braille literacy in the United States. Some of the recommendations in the study include:

- ❖ Requiring national certification in literary Braille among all special education teachers
- ❖ Making Braille resources more available, enhanced production methods and improved distribution
- ❖ Requiring all Braille teachers to pass the National Certification in Literary Braille in order to assure their competency and fluency in the literary code.

As Mwangi (2009) rightly observed, there is need for teachers teaching Braille to undergo in-service courses to enrich their skills. Indeed, professional preparation of teachers for students with visual impairment is of paramount importance. The researcher reached the conclusion that teachers' suggestions summarized above reflected their perception towards education of learners with visual impairment.

Theirs was a legitimate concern that deserves urgent attention. (A full list of teachers' suggestions/recommendations on Braille training curriculum, students' characteristics for Braille learning and educational service delivery is provided in appendix H.

4.10 Interview with Headteachers of Schools for Learners with Visual Impairment

on the Situation of Braille Literacy in their Schools

4.10.1 Brief Overview of the Interview Guide

This section of the study addressed headteachers' perceptions on teachers' attitudes towards Braille literacy in five special primary schools selected for the study. The researcher interviewed five headteachers on individual basis. This was done for the purpose of gathering accurate qualitative information that provided true expression on the situation under investigation. A semi-structured interview guide was used to collect interview data and presented in narrative form using the thematic approach. The interview guide was divided into two sub-sections.

The first sub-section sought information on the biographical data of the headteachers, while the second sub-section elicited responses on what the headteachers' thought about the situation of Braille literacy instruction in schools for learners with visual impairment and the attitudes of teachers towards Braille. The responses were elicited in relation to Objective Seven and other objectives formulated for the study in chapter one to complement the teachers' questionnaire analyzed quantitatively.

4.10.2 Demographic Information of Headteachers

All the five (5) headteachers who participated in the study provided data on their demographic information. Codes were used as pseudonyms in place of the actual names of headteachers to conceal the identity of the interviewees for ethical reasons.

The headteachers were therefore labelled with codes indicating the order in which they were interviewed. Table 4.25 indicates the findings on the biographical data of the headteachers.

Table 4.25: Demographic information on the Headteachers respondents during the interview schedule

Demographic information	Number of respondents (n = 5)	Percent
Age (years)		
25 or under	0	0.0
26 – 35	0	0.0
36 – 45	0	0.0
46 – 55	3	60.0
Above 55	2	40.0
Gender		
Males	3	60.0
Females	2	40.0
Ability to read, write and teach English Braille		
Able	5	100
Not able	0	0.0

Majority (60.0%) of the headteachers who participated in the interview aged between 46 – 55 years. Sixty percent of the headteachers were male while 40% were female. All of them were able to read, write and teach English Braille up to a certain level.

During the pilot study, the researcher noted that the headteacher of the pilot school was female. Thus, the gender distribution of the school heads for the visually impaired was fifty-fifty. However, one would have expected the majority of headteachers who took part in the study to be female, since women accounted for a large proportion of teachers in schools for learners with visual impairment in Kenya as shown by the teachers' biographical data in Table 4.25.

The interview revealed that, all the five headteachers were adequately qualified to manage their respective schools since four (4) of them were holders of B.Ed degree with exception of one who had approved teacher status by the Teachers Service Commission. Their teaching experience ranged from six (6) to twenty-one (21) years.

4.10.3 Analysis of Headteachers Perceptions on Teachers' Attitudes towards Braille Literacy in Schools for Learners with Visual Impairment

This section analyzes the interview data obtained from the headteachers. Thematic approach to qualitative data analysis was adopted in this study. The qualitative data collected from the interview held with the headteachers is presented based on the following six major themes; namely:-

- Headteachers' perceptions towards Braille literacy
- Situation of Braille literacy in Pre-school programmes for young blind learners
- Views on teachers' attitudes towards Braille literacy in their schools
- Perceptions of headteachers on the decline in Braille literacy in schools for learners with visual impairment

- Braille literacy training curriculum improvement
- Relationship between Braille and technology

4.10.4 Headteachers' Perceptions towards Braille Reading and Writing

Question: Can you read, write and teach English Braille? Yes; No

The first interview question in this section sought to find out the headteachers' ability to read, write and teach English Braille. Their responses on this theme were tape-recorded and analyzed to provide more information for the study. When asked about their ability to communicate in Braille, the headteachers gave the following responses:

HTSB/01/03/2016 remarked *"Yes, I can read both Grade 1 and 2. I learned Braille at KISE for a period of two years. Ever since, I have been interested in Braille. I enjoy teaching mathematics which requires both Braille mathematics and abacus. I teach class 8"*.

Another headteacher (**HTSB/02/03/2016**) reported that he was positive towards Braille but felt that he had not mastered sufficient communication skills required. He stated: *"Yes, I can read, write and teach English Braille although my speed in writing and reading is slow. I'm comfortable reading and writing Grade 1 and 1.5 but I can also advance and read Grade 2. I experience challenges both in reading and writing Grade 2, particularly the contractions and composite signs which at times confuse me, but with practice they come along well"*. His personal conviction was that: *"since we teach touch readers in this institution, a teacher has at least two teaching subjects and additional one which makes it important for one to become*

conversant with Braille. I have passion for Braille reading and writing. I feel that one cannot teach touch learners if he/she as the teacher does not have the Braille reading and writing skills”.

The researcher observed that another respondent **HTSB/05/03/2016** had almost similar comments as those expressed below. For example, he said: *“I can read, write and teach in English Braille both English Grade 1 and 2. However, I enjoy reading, writing and teaching Grade 1. I find Grade 2 rather difficult because of the contractions but I have a passion for this because as a teacher I realize I cannot do without it. I’m interested in it. I’m not forcing myself into learning it. When I joined this school, I decided to read Braille like any other teacher”*

A very positive response regarding headteachers’ perceptions on Braille literacy was obtained from **HTSB/04/03/2016**. He remarked: *“Yes, I can read, write and teach English Braille right from the very basic to the highest level i.e. Grade 1 and 2. My enthusiasm in Braille has always been ignited by virtue of bench marking on standards for competence purposes and also to give the best directions to other teaching staff”*. He proceeded, *“I hardly face any challenges because I trained right from the very basic to advanced level, English Braille Grade 1 and 2. However, we do face a few challenges with some teachers, but I strongly encourage them to be familiar with both Braille Grade 1 and 2 and any reference material produced within this English Braille formats”*.

The researcher observed that all interviewees (HTs) had a robust wealth of experience in their career in the field of special needs education. The headteachers had served in their respective schools for an average duration of sixteen years. They stated that they were able to read, write and teach English Braille. However, **HTSB/01/03/2016** noted that he could read both Grade 1 and 2. He learnt Braille at KISE for a period of two years. Ever since, he has been interested in Braille. He enjoys teaching mathematics which requires both Braille mathematics and abacus. He teaches class 8. The interview analysis revealed that the headteachers were passionate about Braille. Their perception towards Braille literacy was therefore positive as demonstrated by their ability to communicate in Braille to a certain extent.

4.10.5 The Situation of Braille Literacy in ECD Programmes

Question: Do you have a pre-school programme in this school? If yes,

- a) How do teachers prepare children with visual impairment for Braille reading and writing?**
- b) What are the attitudes of teachers towards this programme?**

In all the schools study, there was only one kindergarten for young children with visual impairment. Teachers taught young children with visual impairment just the way they taught sighted children. However, they use pegboards, slates and stylus to teach Braille.

The interview revealed that teachers in ECD programmes for young blind learners were not specially trained including those who graduated from KISE and other institutions of higher learning. They did not possess an ECD diploma in special needs

education. They were therefore not qualified to teach young children with visual impairment.

The headteachers reported that the total number of young children with visual impairment enrolled in their ECD programmes was 235 learners listed in a descending order as follows: 101,52,30,27 and 25. However, teachers liked the programme despite the challenges they faced teaching pre-Braille skills. During the evenings and on weekends, house mothers took care of these children. In the school headed by **HTSB/02/03/2016**, there was an ECD section and a number of activities were conducted within this unit before children were introduced to Braille.

At the ECD level the school had three untrained teachers. The headteacher affirmed that “there is need for SNE training to bridge the deficiency, particularly in the educational approaches when teaching fine motor skills and concept development”. He said *“The feeling of teachers in general is that these children who are in ECD really need teachers who are trained in special education since the current ECD teachers are insufficiently equipped to implement the ECD curriculum”*.

In this school, there are approximately thirty children enrolled in the programme spread over in nursery 1 and 2. The headteacher was in agreement with the other headteachers when he affirms that, *“teachers at ECD who do not have pre-Braille skills at kindergarten and nursery, experience challenges and this problem manifests itself when they join class 1 because they lack the very prerequisites for learning Braille”*.

Headteacher HTSB/05/03/2016 summed up the situation of Braille literacy in ECD programmes when he remarked in the interview that: *“we have a preschool program in our school. It is rather old. In fact, I believe that our school was the first to launch a preschool programme for kindergarten. The problem we are experiencing in this programme is that children come when they are very young and parents forget about them. Another problem is the number of languages arising from diverse ethnic communities in Kenya. Children come speaking different dialects and since it is a national programme, teachers encounter challenges trying to align them into speaking a language that they can best communicate in. The children are so young and not able to communicate well. However, they learn from one another.*

The first language used to set precedence to learning pre-Braille skills at this juncture is Kiswahili because this is what helps them. Prior to this, they are taught in their mother tongue. Children have to be told names of animals and so many other things. They have two teachers one blind and the other sighted. When taught by these two teachers they no longer speak their mother tongue.”

She went on to say, *“In my observation as the headteacher, I have noted that the number of activities created or planned for these children are very limited. One is that, the blind teacher cannot move around and engage the children in many activities so that is a problem the sighted can help but she is overwhelmed because the children are so many and she cannot speak their language. The teaching method again in addition to lack of activities is not very well done. The teachers are not trained. Yes*

they have gone through early childhood courses with one having a diploma but no training in SNE to handle young children with visual impairment. So you find the teaching of languages where one has to associate the sound of a word with a letter is not there because teachers are not taught how to associate letters, sounds, and words, with letters. They do a, b, c which we find very difficult because children with visual impairment should not be taught like sighted children. When you say A, they have to see that A, but for blind learners they have to touch that A. At this time their fingers are so tiny that they may not even be able to distinguish between one or two dots. These are some of the issues that teachers have in our preschool programme and I would like to emphasize more on the teacher training programme because that is where schools go wrong. I am not happy about that programme. Teachers don't like it, especially when they hear that they are going to teach it.

They don't like it at all. Yet I believe this is the foundation of Braille learning. They call it pre-Braille skills. The children come without any of these skills. I remember last year, [2015] we only had two children from the entire programme who could read Braille efficiently. I don't know how but the rest of the learners joined standard one without any abilities of reading or writing Braille”.

When asked to comment on the attitudes teachers had towards this programme, the same headteacher remarked: *“Oh! The attitudes are very bad, but we are glad that these two teachers posted to the programme are interested in teaching these children. The rest of the teachers are negative. They are not encouraging others simply because they feel incapacitated to handle the children”.* *“The school has 52 children. The*

most interesting thing about these children is that they have different ages. The oldest is 12 years, which is unheard of in a normal preschool program for learners with no disabilities. So it's difficult. Why this happens is because when they come, they have to begin from where others are beginning. They cannot go to standard one, two or three because others are well advanced in languages; English, Kiswahili and Braille reading. They have to begin after mastering Braille."

4.10.6 Headteachers' Perceptions on Attitudes of Teachers towards Learning and Teaching Braille in the Schools

Question: How would you describe the teachers' perceptions or attitudes towards learning and teaching Braille literacy in this school? If somewhat negative, what are you doing about it?

During the interview, the headteachers reported that teachers' attitude towards learning and teaching Braille in the schools was half-half.

Some teachers had negative perceptions. They do not even want to hear about Braille. They did not want to learn Braille claiming it was hard. Others were very positive. For those teachers who did not think or believe that Braille literacy was important, the headteachers encouraged them to take Braille literacy seriously since the success of their children depended on the knowledge on Braille.

The headteachers strongly discouraged them from relying on their friends to mark Braille assignments for them which were a very common habit among sighted teachers in the five schools for learners with visual impairment. The headteachers'

hoped that, *“Once we have education officers who can read and write Braille, coming to inspect the schools, this problem will be solved once and for all.”*

However, a headteacher reported that, *“In my school, some of the teachers are positive. In fact, most of them like those who are sighted write very good Braille using Braille machines. Generally they have positive attitudes towards Braille. However, it is not 100% true that all the teaching staff have passion for Braille. There are a few exceptional ones that are not interested in it at all, but majority take interest in it. Those with negative attitudes have to seek assistance from colleagues or even learners, especially during marking and preparation of assignments. Due to their limitations in Braille, they are unable to translate this to their learners as they teach, hence eroding Braille standards”.*

The researcher noted that the response from the headteacher **HTSB/05/3/2016** was slightly different from the others. She felt that her teachers’ attitudes were very bad. She felt that nobody wanted to teach Braille. *“However, it varies from individual to individual. Some do not want to teach the lower classes standard 1- 4. Sighted teachers have forgotten Braille and hence seek assistance from other teachers who have proficiency in Braille reading and writing. What I know and what I have experienced in my school is that there are some teachers who have that passion and self-esteem that Braille is equally important, but they are just a handful”.* These are, in most cases, teachers with visual impairment and very few who are sighted. *Otherwise overall majority of them have very negative perceptions towards learning and teaching Braille in this school. As a result of this, the performance of the learners*

has been affected adversely. I believe their learners can take up more subjects particularly science and mathematics if they had adequate backing from their teachers. In English, for example, the learners are not encouraged on reading skills. They hire fellow teachers to mark the work on their behalf. This is something I have noticed and as a result, the standards of Braille have continuously declined over time. As the headteacher, I have encouraged the formation of clubs and panels so that teachers can encourage one another on Braille literacy. My driving motto has always been to tell them that their businesses will be incomplete if they do not step up their capacity in Braille literacy. They also claim they are not paid special allowances and this demotivates them. In addition to this, the learners themselves are not positive, particularly learners with low vision. They do not see the need of learning Braille at all”.

4.10.7 Perceptions of Headteachers on the Decline in Braille Literacy in Schools for Learners with Visual Impairment

Question: If it is true that Braille literacy has recently declined in Kenya, particularly in schools for learners with visual impairment, what factors would you attribute to this decline?

The researcher sought to find out factors that according to headteachers’ opinions were attributed to the decline in Braille literacy in schools for learners with visual impairment in Kenya. Their responses were analyzed and summarized as indicated below:

The headteachers stated that it is true that Braille literacy has declined in schools for learners with visual impairment in Kenya. According **HTSB/01/03/2016**, he strongly felt that the following factors contributed to the decline.

- ❖ Visually impaired learners themselves are not showing much interest in learning Braille these days. They are not like the learners we had in the past, say in the eighties and nineties.
- ❖ Most of the teachers in our schools are not committed to learning Braille. Very few of them are Braille proficient and cannot be said to be competent in Braille teaching.
- ❖ We have inadequate Braille teaching materials e.g. Braille textbooks. Besides, the cost of Braille material is prohibitive. One volume of a Braille book may cost about Kshs 1000.
- ❖ We have inadequate budgetary support from the Ministry of Education. We are depending on well-wishers to provide text books for our pupils.
- ❖ We lack adequate training in Braille for teachers of the visually impaired. Our teachers have not been trained on Braille teaching methods.

Another headteacher **HTSB/02/03/2016** noted that there is a rapid decline of Braille literacy in Kenyan schools. She attributes this to the following factors:

- The teacher's attitudes towards Braille and also towards the learners are negative. Some learners are not interested in Braille. They do not take initiative to learn good Braille.
- The Braille libraries are not equipped with reading literature and even the course books are not made available in good time.

This headteacher advised that course books and other supplementary reading materials in Braille be made available in good time so that the VI learners are not disadvantaged. This will accelerate the enthusiasm to read ahead and enrich Braille literacy among learners with VI. It takes time, to be precise, about three years before receiving the books in Braille format.

In another school, **HTSB/03/2016** noted that it is true that Braille literacy has declined in Kenyan schools for the VI. “This is mainly occasioned by the following factors”:

- Inadequate equipment, teaching and learning materials
- Teachers’ attitudes in general
- Incompetence of Braille instructors and emerging changes in Braille codes. Schools do not have standardized Braille code. “If you read literature in Kiswahili from let’s say, Tanzania, Uganda or Rwanda each of these countries have their own Braille contraction that they use which is not similar to the one in Kenya”.
- Lack of a national Braille certificate for the teachers who the TSC posts to schools which compromise the standard of Braille as teachers from various Teachers Training Colleges (TTCs) go through diverse Braille methods during their training. The content covered varies from one institution to another institution.
- Inadequate learning resource materials which are prohibitive to secure due to underfunding from the relevant ministry is also a major factor contributing to the falling standards of Braille in Kenyan schools for the VI. Braille materials

and equipment are very expensive e.g. the cost of procuring a Braille machine would go to about Kshs. 100, 000.”

HTSB/04/2016 believes that factors that can attribute to Braille literacy decline include:

- ❖ Inequitable resource allocation of reading materials and equipments to school libraries. What schools receive from the ministry is not adequate to facilitate the education of a visually impaired child e.g. a standard eight textbook may have six volumes when transcribed into a Braille format. One volume can cost about Kshs 1200 which means if you are to acquire six of them it would cost you about Kshs 7200 per child, whereas somebody using print would only require about Kshs 300 to buy one book. This is indeed a major factor which affects the acceleration of Braille literacy.
- ❖ If the school had adequate support either from the ministry of education and well-wishers to help us equip our libraries, then it would go a long way in improving Braille literacy for these learners. They would certainly have more exposure to story books by and large improving their abilities in Braille. Unfortunately there are no reading references for these learners which are not the case with their sighted peers. Braille format that would enable them to cultivate the culture of having a wide scope of readership apart from the scanty course books.
- ❖ Lack of Braille policy for teaching Braille in the sense that you don't require a national certificate you only need to have gone through college and graduated.

This is also another factor contributing to the falling standards of Braille literacy in Kenya.

- ❖ The Braille training curriculum which the headteacher proposed to be in place as a bench mark for measuring competence among the teaching fraternity is also another factor contributing to this decline because it has not been decentralized to other TTCs and is only available at KISE and in a few institutions of higher learning.

Finally, **HTSB/05/03/2016** consented that it is true that there is a rapid decline of Braille literacy in Kenyan schools administering special education for the visually impaired learners. She went on to say that she had realized that factors contributing to the decline of Braille literacy in her school included:

- ❖ The perceptions of teachers towards Braille. They are not considering it important at all.
- ❖ With regards to assistive technology, particularly the computer, some teachers are now thinking that Braille is not important and are now behaving as if Braille has been replaced by the computer.
- ❖ Teachers have also realized that the government is also not taking Braille seriously. The inspectors who come to inspect teachers whether they are teaching or not do not know Braille. So teachers take it easy.
- ❖ When it comes to the learners themselves, they have also lost interest in learning Braille. We force them to learn Braille.
- ❖ There is also lack of text books. The government's support of only Kshs. 60, 000 for children with visual impairment is not adequate.

This translates to Kshs. 60 per child which cannot even buy a packet of Braille paper which costs Kshs. 200. With that you cannot afford to buy the materials necessary to facilitate Braille learning.

- ❖ Teachers are opposed to learning Braille Grade 2. They have formed clubs and friends who mark Braille homework assignments and exams for them. So they don't see the need to learn Braille.
- ❖ Lack of commitment from teachers and students: It has become so difficult to salvage Braille literacy and the headteacher believes that this is a very serious issue that schools for learners with visual impairment should address. In her opinion, if the situation is left unattended, definitely there will be no children learning Braille in ten years to come.

4.10.8 Headteachers' Suggestions on Braille Training Curriculum Improvement

Question: What changes would you propose to the Braille training curriculum to improve the quality and competence of Braille teachers in educational programmes for learners with visual impairment?

When headteachers were asked to propose changes to the current Braille training curriculum that they believed would produce qualified and competent Braille teachers for learners with visual impairment, they did not hesitate to give their suggestions/recommendations which were analyzed and summarized as indicated below:

- ❖ A Braille teacher training curriculum that emphasizes Braille reading, writing and teaching methodology is required. They stated that what we have today is

not good enough. No one can learn Braille in only one or three months and be considered qualified to teach learners with visual impairment. After college, teachers should study for national Braille examination and be certified accordingly before their posting by the TSC to schools for learners with visual impairment. There is also need to add mathematics, music and science Braille as vital components in the Braille training curriculum for teachers. On average this should not take less than two years or four semesters at the university level.

- ❖ The curriculum should emphasize on Braille as a subject and teachers should be examined on Braille proficiency before they are posted to SNEs schools for the VI. A national Braille certificate should be awarded to prospective graduates with more time allocation at colleges for Braille.

There should be a certificate dedicated to Braille indicating the modules covered with a transcript indicating the grades obtained when the course was undertaken. In the colleges, the methodology of teaching Braille should be given priority in the curriculum. This is a critical component which should be incorporated in the Braille training for our teachers. It should originate right from ECD level up to class 4.

- ❖ The curriculum should also provide for print and Braille literacy for the low vision users. They should learn Braille because in the event that their vision deteriorates progressively in future, they will still be able to communicate in Braille.

- ❖ Further, the headteachers proposed continuous training programmes to be organized for teachers teaching in schools for the VI because there is need to build up the competence at the school level.

The establishment of Braille training centers within the regions is also necessary because we only have one Braille training center based at the Nairobi headquarters. If Braille training centres were brought closer to the learners, Braille literacy would be improved. Looking at the teachers competence vis-a-vi the curriculum they have gone through, the teachers believe that with further training, their Braille skills can be highly improved.

- ❖ The KICD will supposedly be the body to organize refresher courses for teachers. These are changes that could make them more competent before they are posted by the TSC to schools for the VI which will help to control the falling standards of Braille literacy. A standardized curriculum developed by KICD will mitigate the disparity in question.
- ❖ The headteachers strongly propose that KICD incorporate other stakeholders in the education of learners with visual impairment.
- ❖ The panel that develops this curriculum should be inclusive. Once this is done the trained teachers should be examined and certified with a national Braille certificate from KNEC as the administering examination body.
- ❖ Braille should be regarded as a subject, a teaching subject, an academic subject where students will learn for eight years or even for four years up to secondary school and have it indicated in their certificates as one of the subjects that they learned. The same applies to teachers when they go to college. They should graduate with a Brailernationalcertificate, having done

exams with the national examinations council so that people can start taking Braille seriously. That way, the competence of Braille teachers in our educational programmes will surely be highly improved.

The argument is this, if sign language is now being examined by the examination council why not Braille? And yet, sign language and Braille are now being recognized in the constitution of Kenya. If this is done the competence and quality of Braille literacy in our schools will be highly improved.

The researcher concluded that the headteachers attached a lot of importance to their suggestions which reflected perceptions of teachers towards instruction on Braille literacy generated through a questionnaire for the present study.

4.10.9 Relationship between Braille and Technology in Schools for Learners with Visual Impairment

Question: *Should Braille literacy be abolished in favour of assistive technology in schools for learners with visual impairment?*

Perceptions of headteachers towards the use of Braille and technology in teaching literacy to learners with visual impairment in special primary schools in Kenya were positive. The researcher sought to find out whether headteachers believed that Braille should be abolished in favour of technology or the two could be used simultaneously in teaching literacy to learners with visual impairment. The interview revealed that headteachers had limited knowledge on this subject, particularly those who were above fifty five years of age. Though they were not opposed to the use of assistive

technology in teaching Braille, this category of headteachers expressed their reservations. This interview question took the shortest time to be answered in every school due to the headteachers' limited experience and knowledge in the field of assistive technology. Another reason could have been that the respondents were tired since this was the last question on the interview guide which took approximately forty-five minutes. Headteachers responses were analyzed and summarized as shown below:

In their responses regarding whether Braille should be abolished in favour of technology in teaching literacy to learners with visual impairment, one of the headteachers (**HTSB/01/03/2016**) remarked as follows, *“In my opinion this should never happen. Braille literacy will remain relevant for years to come. What is important is for teachers of the visually impaired to embrace both Braille and assistive technology in the interest of learners who are blind or have low vision.*

It is important to mention at this point that our policy in this school is to teach both Braille and print to learners with low vision. However, my greatest fear is when computers come to our school; people will abandon Braille reading and writing skills, aggravating the problem further. What we want is to have both media used. It is not good for one to remain ICT compliant on one hand and ignorant on Braille on the other”. These sentiments were supported by **HTSB02/02/2016** who stated:

“In my own opinion, Braille literacy should not be abolished in favour of assistive technology. That should never happen. Braille literacy should continue because as

much as we are coming up with this technology, not everybody is exposed to it. So, there is still need for these learners to continue learning Braille. Both Braille and assistive technology should be taught simultaneously. The sovereignty of Braille still reigns and it will take time before users opt for screen-reading as opposed to reading Braille.”

In agreement with the rest of the respondents, **HTSB05/03/2016** vehemently remarked, *“NO! NO! NO! NO! NO! I say no to replacement of Braille with assistive technology. If anything, it is computer technology which should be abolished and be replaced by Braille. Braille is kind of a life-giving stream and source of academic empowerment for blind people. My contention in this unprecedented scenario is: why should Braille be replaced by computers, yet in print we have a pen used by sighted learners which has not been replaced by the computer? Braille is the pen for the blind as the pen is to the sighted. Print and Braille will live forever. Another reason is that children will never learn anything.*

They will be illiterate if they only listen to computers. If they are not taught how to read and write they will be very poor spellers. They will just be imitating. They will only listen but they will not be able to write for anybody. Some of our teachers are now spending a lot of time learning computers hoping that Braille will be abolished soon in favour of technology. Children are also doing the same. They are spending a lot of time with computers. They have forgotten about Braille and yet when they write, they keep on calling people to come and check for them when the computer is not audible. You can never write Braille and ask people to come and check what you have

written. So, I strongly support Braille as a subject and Braille as a source of empowerment. Computers should never, never be used to replace Braille”.

At this juncture, it is worth noting that methodological triangulation was adopted for the present study. Information collected through teachers' questionnaire and interviews with headteachers on their perceptions towards instruction of Braille literacy was analyzed and results compared to determine areas of agreement, as well as areas of divergence. The findings revealed that both teachers and headteachers strongly felt that Braille literacy in special primary schools was not receiving the attention it deserves. As a matter of fact, using interviews as well as questionnaires added a deeper insight into the results that would not have been possible using a single-strategy study, thereby increasing the validity and utility of the findings.

The headteachers' participation in the present study was therefore necessary. As representatives of school administration, they provided vital and critical information pertaining to the status of Braille literacy in their respective schools. In the opinion of the researcher, headteachers' perceptions analyzed in this study, together with those of classroom teachers indicated in other sections of this report, may be used in addressing the problem posed by reported decline in Braille literacy in special primary schools for learners with visual impairment.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the study findings on teachers' perceptions on instruction of Braille literacy in schools for learners with visual impairment in Kenya. It covers the summary of the key findings and conclusions drawn from the study. Recommendations and suggestions for further research are also included.

5.2 Summary of the Main Findings

The study was conducted to investigate and analyze perceptions of teachers regarding instruction of Braille literacy in special primary schools for learners with visual impairment as a result of reported decline in Braille standards emanating from teachers' reluctance to learn and teach Braille. Descriptive survey research design was adopted for the study and the collected data were analyzed quantitatively and qualitatively. The main findings are based on teachers' responses to six key research questions formulated in relation to the objectives of the study.

First, with regards to objective one of the study, the findings established that Braille literacy skills have declined in special primary schools for learners with visual impairment. Factors perceived by teachers as causes of this decline in Braille standards were: increase in multiple disability population, pupil-teacher ratio, inadequate teacher preparation, teacher attitudes, teacher incompetence, complexity of Braille code and reliance on technology. The study findings further revealed that, majority of teachers felt and believed that inadequate teaching materials, lack of

commitment of teachers to learn Braille and lack of frequent Braille refresher courses were some of the major factors influencing Braille literacy.

According to the study findings from objective two, the study revealed that there were two hundred and thirty-five (235) learners with visual impairment enrolled in pre-primary programmes providing early childhood development (ECD) education in the five (5) schools for learners with visual impairment. The study also found out that teachers perceived phonological training and reading activities to develop Braille literacy for young children with visual impairment as critical skills, enabling them to associate sounds in oral language with written Braille letters and words, with a mean of 1.31. The majority of teachers (70%) also felt that young children with visual impairment needed to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words. The findings indicated that teachers in schools for learners with visual impairment lacked access to current resource materials for teaching young Braille beginners, while at the same time; they were not specially trained as ECD teachers for learners with visual impairment.

Despite the shortcomings, findings revealed that, teachers' perceptions on Braille literacy for young Braille beginners were positive, particularly indicating that there is no relationship between teachers' gender and their perceptions on phonological training and reading activities for learners with visual impairment. The study further revealed that there was significant relationship between teachers' teaching experience and their perceptions towards Braille literacy instruction. An analysis of interviews with headteachers participating in the study revealed that young children with visual

impairment in pre-school programmes do not acquire pre-Braille skills before joining standard one.

Findings for objective three of the study revealed that, the most commonly taught topics in Braille training curriculum were: Historical perspective of Braille, transcription and proofreading, Braille knowledge and rules. Training in preparation of instructional materials and reading methodology came second. The study further established that with regards to self-assessment on Braille literacy, almost 90% of the respondents did not know anything about the Nemeth code. However, more than three-quarters were able to read Braille, use the Perkins Braille and develop teacher-made materials for Braille instruction. Nearly three-fifths had acquired reading methodology, whereas proficiency in using slate and stylus was one of the least skills acquired. Concerning their opinion on professional preparation in Braille literacy instruction upon completion of the Braille literacy training, teachers felt that their Braille skills and ability to teach Braille were satisfactory. However, at the time of the present study, their Braille skills and ability to teach Braille were no longer satisfactory.

For objective four, the study findings revealed that nearly two-thirds of the teachers could teach English Braille Grade 1 and English Braille Grade 2 very well. They were also of the opinion that children who use contracted Braille are better spellers and faster readers than children who read English Braille grade 1. Further, the study revealed that teachers who were advanced in age felt that Braille should be taught only by teachers with visual impairment in schools ($r = 0.560$, $P < 0.001$).

Younger teachers reported that they could not teach English Braille grade 1 and English Braille grade 2 very well ($r = 0.285$, $P = 0.038$).

With regards to objective five of the study, the findings established that teachers believed that teaching both Braille and print reading and writing had a positive advantage for some learners with low vision with a mean response of 1.68. Teachers strongly supported the statement that learners with low vision should be taught both Braille and print reading and writing regardless of how good their vision is, with the mean response of 2.06. The study also established that teachers provided Braille as an alternative medium for children who were experiencing progressive loss of vision, with a mean of 2.08. The statement was supported by nearly 80% of the respondents. The study revealed that schools for learners with visual impairment do not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print, with a mean of 2.21.

Findings for objective six revealed that nearly three quarters of the respondents indicated that technological devices should be used to enhance Braille, not to replace it, with a mean response of 1.25. Two-thirds of the teachers believed that digital technology will open up access to vast print and Braille materials in many academic subjects, with a mean response of 1.38. They also agreed that Braille is an important learning medium in the face of new information technology era. More than half felt that Braille and technology should be taught to children with visual impairment in schools, with a mean response of 1.40.

Furthermore, an analysis of the opinion of teachers on the use of Braille and assistive technology in teaching literacy skills were subjected to a correlation analysis against the teacher's age. The study revealed that teachers who had many years of experience teaching Braille disagreed with the statement that digital technology will open up access to vast print and Braille materials in many academic subjects ($r = 0.300$, $P = 0.036$).

5.3 Conclusions

On the basis of findings of the present study, the researcher reached the following conclusions:-

- i. Decline in Braille literacy in special primary schools for learners with visual impairment is real. This was reported by teachers in the study and confirmed by responses from headteachers of five schools for learners with visual impairment through an interview conducted by the researcher as part of the present study.
- ii. ECD programmes in special primary schools for learners with visual impairment were not taken seriously. Teachers in schools for learners with visual impairment lacked access to current resource materials for teaching young Braille beginners, while at the same time, they were not specially trained as ECD teachers for learners with visual impairment. Furthermore, pre-Braille skills were not emphasized as a foundation for Braille, while younger teachers strongly agreed that they were not aware of methods and materials for teaching Braille to young children with visual impairment.

Besides, young children with visual impairment in pre-school programmes do not have pre-Braille skills before joining standard one which is not the case with their sighted counterparts.

- iii. Braille training curriculum for professional preparation of teachers on instruction of Braille literacy in Kenya requires an overhaul. Academic training institutions have the responsibility of producing qualified and competent teachers for learners with visual impairment. As revealed by findings of this study, a Braille teacher training curriculum that emphasizes Braille reading, writing and teaching methodology is necessary. There is also need to add mathematics, music and science Braille as vital components in the Braille training curriculum for teachers. On average, this should not take less than two years or four semesters at the university level. Equally important is consideration for offering Braille as an examinable subject for all learners with visual impairment at all levels of education.
- iv. Finally, the researcher came to the conclusion that the study succeeded in achieving its purpose and objectives. The high return rate of teachers' questionnaires and headteachers' willingness to participate in the study provided sufficient information to answer seven key research questions formulated for the study. Issues pertaining to Braille literacy instruction should be approached from three perspectives: teacher characteristics, learning environment, instructional strategies and curriculum design. For effective professional preparation for Braille literacy instruction, teachers should not only train in Braille but also be offered Braille refresher courses on a regular basis in addition to being given opportunities to attend seminars and

workshops on Braille. A conducive Braille learning environment will imply provision of adequate resource materials and facilities in all schools for learners with visual impairment which is not the case at the moment. Teachers and students will have to change their attitudes towards Braille, while the Ministry of Education may have to re-think its budgetary support for Braille. With respect to instructional strategies and curriculum design, it cannot be overemphasized that learning Braille is not tantamount to teaching Braille. Teachers require appropriate teaching strategies and Braille teaching guides to improve instruction on Braille literacy. A comprehensive Braille curriculum for schools is inevitable and should receive the attention it deserves. Indeed, curriculum development is the mandate of KICD but the exercise should be made more inclusive by involving more stakeholders, particularly teachers of learners with visual impairment. The success or failure of teaching literacy through Braille in schools stands or falls on teachers' perceptions towards Braille.

5.4 Recommendations

Based on the findings of the study, the following recommendations were made, with a view to improving Braille literacy in special primary schools for learners with visual impairment:-

5.4.1 Policy Recommendations

- i. On the basis of objectives two and three, the study recommends that the Ministry of Education through the Teacher Service Commission adequately

supports the ECD programmes for learners with visual impairment with specially trained teachers.

These should be teachers who have a diploma or degree in early childhood education from a recognized institution offering special needs education. The ministry should also facilitate SNE teachers to attend Braille refresher courses, seminars and workshops on a regular basis.

- ii. Even though curriculum development is the mandate of KICD, the study recommends that teachers be involved in developing a comprehensive Braille curriculum for schools for learners with visual impairment. At the same time Braille should be considered as an examinable subject for learners with visual impairment at all levels of education, after which national certificate would be issued by the examining body. The same should apply to all teachers wishing to teach Braille.
- iii. The study recommends that the Ministry of Education through the Division of Special Needs Education considers recognizing the unique and challenging roles of teachers of learners with visual impairment and motivate them to remain in the special primary schools for learners with visual impairment. These teachers can be recognized through Annual National Best Teachers Awards.
- iv. The Ministry of Education should make a deliberate effort to increase funds to the schools for learners with visual impairment. The study recommends that such funds be released on time to the schools to enable the school managements to acquire the resources needed to facilitate effective teaching and learning Braille.

The study further recommends that the school management boards be encouraged to be innovative enough to source for funds from the community, NGOs and business organizations to procure needed materials required by teachers.

5.4.2 Recommendations for Further Research

- i. The present study focused on analysis of teachers' perceptions on instruction of Braille literacy in schools for learners with visual impairment. There is need to extend the study from special primary schools for learners with visual impairment to inclusive schools and integrated programmes for learners with visual impairment.
- ii. A study is required to determine factors influencing Braille literacy skills development for young children with visual impairment.
- iii. There is need to investigate attitudes of learners with low vision in special schools for visually impaired towards Braille literacy.

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APPENDIX A:**LETTER OF INTRODUCTION**

My name is Dr.ChombaWaMunyi from Kenyatta University. The purpose of this research questionnaire is to help the researcher gather information on teachers' perceptions regarding instruction of Braille literacy in schools for learners with visual impairment in Kenya. Please, as you fill in this questionnaire, note that all information given shall be treated with utmost confidentiality. Thank you for accepting to participate in this research.

APPENDIX B:
RESEARCH QUESTIONNAIRE

SECTION ONE: DEMOGRAPHIC INFORMATION

Please check the appropriate response.

1. Age:

25 or under 26 -35 36-45 46-55 Above 55

2. Gender:

Male Female

3. Do you have any physical disability? Yes No

4. If yes, what kind of disability do you have?

Physical Visual

5. Level of education:

P¹ Diploma B.ED Degree M.ED

6. Number of years in teaching Braille:

0 - 3 4-6 7-10 11-15 Over 15

7. Designation:

Senior teacher Subject teacher Classroom Teacher

SECTION TWO

In this section, please rate and tick (√) the following statements on a scale on 1 to 5:

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Generally, students' Braille literacy skills have declined in our schools.					

2. If it is true that Braille literacy has declined, the most likely causes of the decline in Braille literacy are: -

Please, check all that apply with a tick (√) against your choices

- (A) Reliance on technology
- (B) Teacher attitudes
- (C) Increase in multiple disability population
- (D) Inadequate teacher preparation
- (E) Emphasis on vision utilization by learners with low vision
- (F) Complexity of the Braille code
- (G) Teacher incompetence
- (H) Pupil-teacher ratio

Other (please describe in the following space): _____

SECTION THREE

In this section, please rate and tick (✓) the following statements on a scale on 1 to 5:

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Braille is to the blind as print is to the sighted					
2.	I enjoy learning and teaching Braille in my school					
3.	The reading process of children with visual impairment is affected by limited opportunities for letters and words before joining school					
4.	Ability to detect sounds in oral language and link them to Braille letters or words (phonological skills) is critical for young Braille beginners					
5.	We lack access to current resources on teaching early Braille literacy in our schools					
6.	I am not aware of methods and materials for teaching Braille to young children with visual impairment					
7.	As a pre-Braille skill, training children with visual impairment to identify letters and words in oral language according to sounds is a major concern in schools for learners with visual impairment today					
8.	Young children with visual impairment need to be exposed to activities that enable them to associate sounds in oral language with written Braille letters and words					

9. We use the following activities to promote sounds-letter and sounds-word association skills with young children with visual impairment : (check all that apply)

- a. Singing and listening to songs
- b. Nursery rhymes and chants
- c. Reading stories with interesting sounds/rhymes
- d. Building knowledge of sound-symbol associations in meaningful context
- e. Inventing words that rhyme with child's' name
- f. Playing with sounds in words (e.g. tongue twisters)
- g. Playing word games with children to identify beginning sounds in words
- h. Pointing out particular sounds in words when reading a story book

SECTION FOUR

1. My Braille training included:-

Please, check all that apply with a tick (✓) against your choices

A.	Historical perspective of Braille	<input type="checkbox"/>
B.	Braille readiness	<input type="checkbox"/>
C.	Reading methodology	<input type="checkbox"/>
D.	Instructional materials	<input type="checkbox"/>
E.	Experience with Braille users	<input type="checkbox"/>
F.	Transcription, proofreading, Braille knowledge and rules	<input type="checkbox"/>
G.	Methodology in the teaching of Braille reading	<input type="checkbox"/>

2. My Braille training required me to:-

Please, check all that apply with a tick (√) against your choices

Demonstrate -

i.	Proficiency with Perkins Brailier	
ii.	Proficiency with slate & stylus	
Iii.	Ability to read Braille	
iv.	Knowledge of Braille reading methodology	
v.	Proficiency in the Nemeth code	
vi.	Knowledge of assistive aids	
vii.	Ability to develop teacher-made materials for Braille instruction	
viii.	Ability to write lesson plans	

3. My Braille training should have included more teaching methodology.

Agree

Neutral

Disagree

4. I have participated in the following professional development programs:-

Please, check all that apply with a tick (√) against your choices

Braille refresher courses/workshops

Online Braille courses

Professional Braille literacy conferences

5. In the following questions, please rate and tick (✓) the following statements on a scale on 1 to 5:

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
i.	When I completed my Braille training, I felt that my Braille skills were satisfactory.					
ii.	When I completed my Braille training I felt that my ability to teach Braille was satisfactory.					
iii.	I currently feel that my Braille skills are not satisfactory.					
iv.	I currently feel that my ability to teach Braille is not satisfactory.					
v.	The majority of teachers of visually impaired learners do not have satisfactory Braille skills.					
vi.	Refresher training courses in Braille should be provided on a regular basis for teachers of learners with visual impairment.					

SECTION FIVE

In this section, please rate and tick (✓) the following statements on a scale on 1 to 5:

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	I prefer teaching English Grade 1 Braille to English Grade 2 Braille					
2.	I can teach English Braille Grade 1 and English Braille Grade 2 very well					
3.	I feel that Braille should be taught only by teachers with visual impairment in schools for learners with visual impairment					
4.	Braille contractions affect the learners' reading fluency, spelling and efficiency of hand movements when reading					
5.	Children who use contracted Braille are better spellers and faster readers than children who read English Braille Grade 1					

SECTION SIX

In this section, please rate and tick (✓) the following statements on a scale on 1 to 5:

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Teaching Braille literacy to learners with low vision is a wastage of time and effort					
2.	Teachers provide Braille as an alternative medium for children who are experiencing progressive loss of vision.					
3.	Learners with low vision should be taught both Braille and print reading and writing (dual media) regardless of how good their vision is					
4.	A learner with low vision has the right to choose whether he/she prefers reading and writing in Braille, print or a combination of both print and Braille(dual media)					
5.	Learners with low vision in our schools are not exposed to Braille literacy, but learn Braille on their own from their peers					
6.	Teaching both Braille and print reading and writing has a positive advantage for some learners with low vision					
7.	We do not have a standardized assessment tool developed to help teachers determine whether children should receive literacy instruction through Braille, print or through a combination of Braille and print					
8.	I am confident in my ability to make decisions concerning my students' learning media.					
9.	Legislation requiring the teaching of Braille to all children with low vision when requested by their parents is a good idea.					
10.	Decisions about students' learning media should be an IEP committee's decision.					

SECTION SEVEN

In this section, please rate and tick (✓) the following statements on a scale on 1 to 5:

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Technological devices should be used to enhance Braille, not to replace it.					
2.	Braille and technology should be taught to children with visual impairment in school					
3.	Digital technology will open up access to vast print and Braille materials in many academic subjects					
4.	Advances in digital technology have reduced the relevance of Braille					
5.	Computer technology has an adverse effect on the development of Braille literacy					
6.	Braille is not an important learning medium in the face of new information technology era.					
7.	The computer technology will make Braille unnecessary.					

SECTION EIGHT:***Open ended question***

Please use this space for your comments about your professional preparation as a specialist teacher of learners with visual impairment e.g. suggestions for teacher training curriculum, students characteristics for Braille learning, educational service delivery e.t.c

APPENDIX C:**INFORMED CONSENT FORM FOR TEACHERS**

My name is Dr. ChombaWaMunyi from Kenyatta University.

Title of research Study:

ANALYSIS OF TEACHERS' PERCEPTIONS ON INSTRUCTION OF
BRAILLE LITERACY IN PRIMARY SCHOOLS FOR LEARNERS WITH
VISUAL IMPAIRMENT IN KENYA

By filling out this questionnaire / answering the questions put to me:-

- I agree to participate in this research project.
- I have read this consent form and the information it contains and had the opportunity to ask questions about them.
- I understand that I was selected to participate in this study due to my expertise
- I understand that I was selected randomly from a larger group of people with my expertise
- I agree that my responses be used for education and research on condition my privacy is respected. I understand that my responses will be used in aggregate form only, so that I will not be personally identifiable.
- I understand that I am under no obligation to take part in this research.
- I understand I have the right to withdraw from this research at any stage.
- I understand that this research might be published in a research journal or book. In the case of dissertation research, the document will be available to readers in a university library in printed form, and possibly in electronic form as well.

Name of Participant : _____

Signature of Participant : _____

Date : _____

APPENDIX D:**INTERVIEW GUIDE FOR HEADTEACHERS**

My name is Dr.ChombaWaMunyi from Kenyatta University. This interview schedule is to help the researcher gather information on headteachers' perceptions towards Braille literacy in schools for learners with visual impairment in Kenya. All information given shall be treated with utmost confidentiality. Thank you very much for accepting to participate in this interview.

1. Name of the school
2. Age: 25 or under 26-35 36-45 46-55 Above 55
3. How long have you been in this school?
4. Can you read, write and teach English Braille?
5. Do you have a pre-school program in this school?
 - A. How do teachers prepare children with visual impairment for Braille reading and writing?
 - B. What are the attitudes of teacher towards this program?
 - C. How many learners are enrolled in the Programme?
6. How would you describe the teachers' perceptions or attitudes towards learning and teaching Braille literacy in this school? If somewhat negative, what are you doing about it?

7. If it is true that Braille literacy has recently declined in Kenya, particularly in schools for learners with visual impairment, what factors would you attribute to this decline?
8. What changes would you propose to the Braille training curriculum to improve the quality and competence of Braille teachers in educational programs for learners with visual impairment?
9. Should Braille literacy be abolished in favour of assistive technology in schools for learners with visual impairment?

APPENDIX E:**INFORMED CONSENT FORM FOR THE HEADTEACHERS**

My name is Dr.ChombaWaMunyi from Kenyatta University. Thank you for agreeing to participate in this study, which will take place in March, 2016. This form details the purpose of this study, a description of the involvement required and your rights as a participant. The purpose of this study is to find out teachers' perceptions towards teaching Braille literacy in special primary schools for learners with visual impairment in Kenya. The benefits of the research will be:-

- Improved quality of Braille literacy in special primary schools for learners with visual impairment resulting from analysis of teacher' perception towards Braille.

The methods that will be used to meet this purpose include:

- Your participation in the interview designed for the study

You are encouraged to ask questions or raise concerns at any time about the nature of the study or the methods I am using. Please contact me at anytime at the e-mail address or telephone number listed above.

Our discussion will be audio taped to help me accurately capture your insights in your own words. The tapes will only be heard by me for the purpose of this study. If you feel uncomfortable with the recorder, you may ask that it be turned off at any time. All information will be treated with utmost confidentiality. You also have the right to withdraw from the study at anytime. In the event you choose to withdraw from the study, all information you provide including tapes will be destroyed and omitted from the final dissertation.

By signing this consent form, I certify that I _____
agree to the terms of this agreement.

(Signature)

(Date)

APPENDIX F:

RESEARCH AUTHORIZATION LETTER



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
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when replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No.

Date:

NACOSTI/P/16/47331/10052

27th June, 2016

Dr. Murithi J. Chomba Munyi
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “*Analysis of teachers’ perceptions on instruction of braille literacy in primary schools for learners with visual impairment in Kenya,*” I am pleased to inform you that you have been authorized to undertake research in **selected Counties** for the period ending **27th June, 2017.**

You are advised to report to **the County Commissioners and the County Directors of Education of the selected Counties** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

A handwritten signature in blue ink, appearing to read 'Boniface Wanyama', is positioned above the printed name and title.

**BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioners
Selected Counties.

The County Directors of Education
Selected Counties.

APPENDIX H:**ANALYSIS OF TEACHERS' SUGGESTIONS / RECOMMENDATIONS****(i) Braille Training Curriculum**

- There should be workshops for teachers dealing with learners with visual impairment to equip them with proper Braille skills for efficient delivery in classes;
- All teachers should learn special needs education right from teacher training and there should be specialization;
- The ratio of low vision and totally blind teacher pupil should be 1:10;
- Braille should be taught as a method course in the university and thereafter, every teacher of the V.I should obtain a national Braille certificate after sitting an exam with the KNEC;
- There is need for a Braille training curriculum developed by KICD to train teachers on ECD programmes in schools;
- Involvement of Braille teachers in all aspects of teaching the VI learners, teaching methodology, materials development and review, development of evaluation tools and learning resources preparation;
- Qualified personnel in the area of V.I (Braille literacy) at Jogoo house;
- Sensitization of teachers on Braille reading and writing in teacher training colleges;
- Establishment of workshops for making assistive devices for visually impaired available locally;
- Provision of refresher courses in Braille on a regular basis for teachers of learners with visual impairment;

- Teachers to be involved in curriculum development. They should go for Braille writing and Braille reading seminars; and
- A teacher teaching Braille should have a Braille machine for practice.

(ii) Teacher's suggestions for students' characteristics for Braille learning

- Learners should be encouraged to develop positive attitude towards Braille as a mode of learning;
- Qualified teachers for young blind learners in ECD programs;
- Emphasis on methods and activities for teaching pre-Braille reading skills as the foundation for reading Braille; and
- Low-vision learners to be provided with low vision books and reading diaries

(iii) Teacher's suggestions for educational learning service delivery

- Technology should be used to enhance Braille and more teachers should be trained on the same;
- standardized assessment tool should be developed to determine learner category;
- KICD should develop a full Braille curriculum for our learners so that it can be taught as an examinable subject;
- For effective Braille teaching, the curriculum developers should allocate time for Braille teaching and see to it that all the schools for learners with visual impairment allocate it adequate time on the timetable;
- Braille should be recognized as a subject by the ministry of education;

- KICD should develop a full Braille curriculum to be taught as an examinable subject for our learners. This is the only way teachers and learners can change their negative attitude; and
- TSC should insist on teachers who have been certified as teachers of the V.I by the KNEC after passing Braille exams.