

**MASTERY OF KENYAN SIGN LANGUAGE AND ACADEMIC PERFORMANCE  
OF PUPILS WITH HEARING IMPAIRMENT IN PUBLIC PRIMARY SCHOOLS  
IN WESTERN REGION, KENYA**

**TOM MDJEMBI WAWIRE**

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**NOVEMBER, 2023**

**DECLARATION**

This thesis is my original work with no other than the indicated sources and support and has not been submitted elsewhere for the award of a degree.

Signature .....

Date .....

**TOM MDJEMBI WAWIRE**

**REG NO: ECI/G/13/10**

**CERTIFICATION**

The undersigned certify that they have read and hereby recommend for acceptance of Masinde Muliro University of Science and Technology entitled ‘**Mastery of Kenyan sign language and academic performance of pupils with hearing impairment in public primary schools in Western Region, Kenya**’

**PROF. AGGREY MUKASA SIMIYU**

Department of Curriculum and Instructional technology

Masinde Muliro University of science and Technology

Signature .....Date .....

**DR. NICK NAMUNGA**

Department of Curriculum and Instructional Technology

Masinde Muliro University of Science and Technology

Signature .....Date .....

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## ABSTRACT

The government of Kenya recognizes the importance of special needs education as a crucial sector for accelerating the attainment of Education for all (EFA) and the Sustainable Development Goals (SDGs). The purpose of this study was to establish the relationship between teachers and learners mastery of Kenyan Sign Language and academic performance of pupils with hearing impairment in public primary schools in western Kenya. Study objectives were establish the relationship between pupils' interpretation of Kenyan sign Language on academic performance, to establish the relationship between pupils' literacy in Kenyan sign language on academic performance, and to establish the challenges faced by pupils with HI and teachers in the learning and teaching process of KSL. The study was guided by Bandura's Social Learning Theory. The study employed the ex post facto research design to collect qualitative and quantitative data. Using purposive sampling technique, 12 head teachers, 93 teachers and 108 pupils with hearing impairment were selected, forming a sample size of 213 respondents. Research instruments used were questionnaire and interview schedule. Piloting of the questionnaire was done in a public special primary school for pupils with hearing impairment in the neighbouring Trans Nzoia County. The collected data was analysed by use of descriptive statistics of frequencies, percentages, means, standard deviation and inferential statistics of chi-square using the statistical package for social sciences [SPSS] program version 20.00. Qualitative data was analysed by describing the emerging themes in relation to the study objectives. The study established that there was significant relationship between pupils' interpretation of KSL, literacy in KSL and challenges in using KSL and academic performance, all at  $p < 0.05$ . Therefore, null hypothesis was rejected and it was concluded that mastery of KSL significantly influences academic performance. The study concluded that the utilization of Kenya sign language interpretation by learners with hearing impairment has an impact on their academic achievement. Pupils Literacy in KSL influenced their Academic Performance. Further the study concluded that pupils with hearing Impairment face challenges in regard to mastery of KSL hence affecting their academic performance. Among other recommendations, the government is advised to establish a comprehensive training for the teachers of the learners with HI in order to increase their numbers. In-service training should also be encouraged so as to help normal teachers employed in special schools for learners with HI or units to teach well and professionally. Further, the government together with school administrations should enhance awareness campaigns for the purpose of changing the social stereotypes and negative culture of the hearing community on matters of Deaf Education in general. This could include having awareness seminars or public speeches.

## **DEDICATION**

To my parents, wife and children whose tireless efforts, sacrifice and encouragement has resulted into this work

## TABLE OF CONTENT

<b>DECLARATION .....</b>	<b>ii</b>
<b>ACKNOWLEDGEMENT .....</b>	<b>iii</b>
<b>ABSTRACT.....</b>	<b>iv</b>
<b>DEDICATION .....</b>	<b>v</b>
<b>TABLE OF CONTENT .....</b>	<b>vi</b>
<b>LIST OF TABLES.....</b>	<b>ix</b>
<b>LIST OF FIGURES.....</b>	<b>x</b>
<b>ABBREVIATIONS AND ACRONYMS.....</b>	<b>xi</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>INTRODUCTION TO THE STUDY.....</b>	<b>1</b>
1.0 Introduction.....	1
1.1 Background of the study.....	1
1.2 Statement of the Problem.....	5
1.3 Purpose of the study.....	6
1.4 Specific Objectives .....	6
1.5 Research hypotheses .....	6
1.6 Significance of the Study.....	6
1.7 Scope of the Study.....	7
1.8 Assumptions of the Study.....	7
1.9 Theoretical Framework.....	8
1.10 Conceptual Framework.....	9
1.11 Operational Definition of Key Terms.....	10
<b>CHAPTER TWO.....</b>	<b>12</b>
<b>LITERATURE REVIEW .....</b>	<b>12</b>
2.0 Introduction.....	12
2.1 Sign language.....	12
2.2 Academic performance of learners with HI.....	14
2.3 Effect of Literacy in KLS and academic achievement. ....	18

2.4 Challenges faced by learners and teachers in using Kenyan sign language .....	23
2.5. Research Gaps .....	28
<b>CHAPTER THREE.....</b>	<b>31</b>
<b>RESEARCH DESIGN AND METHODOLOGY.....</b>	<b>31</b>
3.0 Introduction.....	31
3.1 Research Design .....	31
3.2 Location of the Study.....	32
3.3 Target Population.....	32
3.4 Sample Size and Sampling Procedure .....	33
3.5 Data Collection Instruments .....	33
3.5.1 Questionnaire.....	33
3.5.2 Interview Guide .....	34
3.6 Data Collection Procedures .....	35
3.8 Validity of Research Instruments .....	35
3.9 Reliability of Research Instruments.....	36
3.10 Limitations and Delimitations of the Study.....	37
3.11 Data Analysis.....	38
3.12 Ethical Consideration.....	39
<b>CHAPTER FOUR .....</b>	<b>41</b>
<b>DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION.....</b>	<b>41</b>
4.0 Introduction.....	41
4.1 Demographic information of the respondents .....	41
4.1.1 Age of the pupils.....	41
4.1.2 Age of teachers and head teachers.....	43
4.1.3 Gender of pupils, teachers and head teachers .....	43
4.1.4 Academic levels of teachers and head teachers.....	44
4.2 Academic performance of learners with hearing impairment .....	45
4.3 Influence of pupils' interpretation of KSL on academic performance .....	47
4.4 influence of pupils literacy in ksl on their academic performance.....	55
4.5 Challenges faced by Pupils with hearing Impairment in learning of KSL .....	61

<b>CHAPTER FIVE .....</b>	<b>65</b>
<b>SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>65</b>
5.1 Introduction.....	65
5.2 Summary of Findings .....	65
5.2.1 Influence of interpretation of KSL and academic performance of pupils with HI.....	65
5.2.2 Effects of Pupils Literacy in KSL on their Academic Performance.....	66
5.2.3 Challenges faced by pupils with hearing impairment in the learning process .....	67
5.3 Conclusion.....	69
5.4 Recommendations.....	70
5.5 Recommendations for further research.....	71
<b>REFERENCES .....</b>	<b>72</b>
<b>APPENDICES.....</b>	<b>75</b>
APPENDIX A: PUPILS’ QUESTIONNAIRE.....	75
APPENDIX B: TEACHERS’ QUESTIONNAIRE.....	78
APPENDIX D: STUDY PLAN.....	81
APPENDIX E: BUDGET .....	82
APPENDIX F: RESEARCH PERMIT.....	83
APPENDIX G: MAP OF KENYA INDICATING THE LOCATION OF WESTERN .....	84
KENYA .....	84



## LIST OF TABLES

Table 1. 1: KCPE Results from 2013-2017 .....	4
Table 3. 1: Target Population .....	32
Table 3. 2: Sample size.....	33
Table 4. 1: Ages of the pupils.....	42
Table 4. 2: Ages of the teachers and the head teachers .....	43
Table 4. 3: Gender of the pupils, teachers and head teachers.....	44
Table 4. 4: Academic levels of teachers and head teachers.....	45
Table 4. 5: Academic performance of learners with HI .....	45
Table 4. 6: T-test of mean difference in academic performance between male and female pupils with hearing impairment.....	46
Table 4. 7: Influence of KSL interpretation on academic performance according to pupils. 47	
Table 4. 8: Influence of KSL interpretation on academic performance according to the teachers .....	51
Table 4. 9: Relationship between interpretation of KSL and academic performance .....	54
Table 4. 10: Pupils perception on the influence of KSL literacy on their academic performance .....	55
Table 4. 11: Teachers' perception on the influence of literacy in KSL on academic performance of pupils with HI.....	58
Table 4. 12: Relationship between literacy in KSL and academic performance.....	60
Table 4. 13: Teachers responses on challenges faced by pupils with HI in learning KSL....	61
Table 4. 14: Pupils with HI responses on challenges they face in learning KSL .....	62
Table 4. 15: Relationship between challenges faced in learning of KSL and academic performance of learners with HI.....	63

## LIST OF FIGURES

Figure 1. 1: Conceptual Framework Model .....	9
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## **ABBREVIATIONS AND ACRONYMS**

<b>ASL</b>	-	American Sign Language
<b>CI</b>	-	Cochlear Implant
<b>HI</b>	-	Hearing Impairment
<b>IEP</b>	-	Integrated Education Plan
<b>KSL</b>	-	Kenyan Sign Language
<b>MOE</b>	-	Ministry of Education
<b>NCLB</b>	-	No Child Left Behind
<b>SE</b>	-	Signed English
<b>SEE</b>	-	Signed Exact English
<b>SPSS</b>	-	Statistical Package for Social Science (SPSS)
<b>TC</b>	-	Total Communication
<b>UN</b>	-	United Nations
<b>UNESCO-</b>		United Nations Education Scientific and Cultural Organization
<b>US</b>	-	United States

## CHAPTER ONE

### INTRODUCTION TO THE STUDY

#### 1.0 Introduction

This chapter presents the background to the study, statement of the problem, purpose of the study, study objectives and research hypotheses. Others are assumptions of the study, scope and limitations of the study, conceptual framework and operational definition of terms.

#### 1.1 Background of the study

Language is a communication system that uses traditional symbols and body kinetics to transmit thoughts and emotions of individuals. It is made up of sounds, gestures, and/or written symbols (Suzette, Igin & Fischer, 2014). Sign Languages (SLs) utilized by Deaf Communities differ from spoken languages in that they are visual-gestural in perception and articulation. SLs use concurrent systems of manual, facial, and body gestures to communicate (Reag & Mothy, 2010). Learners who utilize sign language and other cultural aspects are distinguished from normal learners who are hard of hearing (Moore, 2002). In general, learners with significant hearing loss find it challenging to grasp and use common language as their peers (Luetke-Stahlman, 1998). Furthermore, deaf children may begin to read at the same time as their hearing peers, but their literacy growth is often slower than that of hearing pupils (Schirmer, 2001).

Ambridge and Lieven (2011) discovered in their global study on English language acquisition that the environments in which children were raised had a substantial influence on their linguistic development and acquisition. Gallaudet Research Institute looked into the national averages for how well hearing impaired learners do on the Stanford Achievement Test series. The results of the research indicate that deaf learners persistently lag behind

their hearing counterparts on standardized assessments of academic competence. This creates significant apprehension regarding the overall academic advancement of the learners (Gallaudet Research Institute, 2005).

Rwaimba (2016) cites research by Chupina (2006), which states that in 1995 Swedish Sign Language replaced Swedish as the language of teaching in the country. At school, deaf learners study Swedish Sign Language alongside Swedish written language. Sign language and spoken language are also covered in courses designed for the hearing impaired. It was concluded that this helped hard of hearing and Deaf learners in Sweden become literate. Marschark et al. (2015) found that deaf and hard-of-hearing (DHH) secondary learners performed better on a mathematics subtest than on reading comprehension subtests of the Woodcock-Johnson Tests of Cognitive Abilities and Tests of Achievement, despite both scores being significantly lower when compared to the hearing population.

The 2001 No Child Left Behind Act (NCLB) in the United States of America was intended to promote legislative initiatives, set up demanding expectations, establish compatible evaluations and improve district and school accountability frameworks focused on education outcomes (Mouny, 2001). In the light of comprehensive research, Sign Language is a significant factor which is more complex than any language of daily use (Gutierrez, 2002).

Kalya (2020) cites research by Mbewe (1983, 1991), Kalabula (1993), and Kitwishi (1995) that demonstrates the persistent achievement gap between deaf and hearing learners in Zambia. Learners with hearing loss had disconcertingly low achievement (The Zambian Ministry of Education, Science, vocational Training and Early Education; Planning unit, 2012). Even in Zambia, where there appears to be no policy on the teaching of sign language

to assist teachers, Mulonda (2013) discovered that sign language was the predominant means of communication between both teachers and learners.

Kenya agreed to the Salamanca Declaration and Framework for Action in 1994 (UNESCO, 1994), which mandated that all schools accommodate learners with cognitive, sensory, and motor impairments. Anderson et al. (2018) found that children with hearing impairment fared poorly in reading, spelling, and mathematics in Uganda, however the causes of this are unclear. Furthermore, Akellot and Bangirama (2019), quoting Etsey (2005), argue that the performance of deaf children has been low, implying that academic skills beneficial for learning have not been achieved, based on the results of the yearly primary leaving tests in Uganda.

Subsequently, numerous special institutions have been established throughout the nation to accommodate these children. This has resulted in the legal recognition of Kenyan Sign Language (KSL) in the Kenyan constitution, which benefits the hearing-impaired learner (GoK, 2010). The 1989 UN Universal Declaration of Human Rights, as cited in Imbiti (2014), mandates the elimination of obstacles, such as the manner of communication, that could impede the advancement of education for learners with hearing impairment. Adoyo (2007) states that the Education Ministry oversees the Deaf Education Division in Kenya, which is responsible for the administration of education for learners with special educational requirements.

According to Kimani (2012), education for the hearing impaired in Kenya is a dynamic subfield of the Kenyan educational system dedicated to serving the needs of deaf, hard-of-hearing, and hearing-impaired learners. Numerous organizations have been founded in Kenya with the objective of safeguarding the rights of Kenyan citizens and advancing deaf

education. The education system in Kenya is continuously evolving and developing in this regard.

Lewis (2009) conducted a study in Kenya which revealed that a total of 32 out of 71 institutes utilize KSL for pupils with hearing disabilities. The utilization of Kenyan sign language is thus characterized by a sense of optimism. However, Owiko (2009) argues that further investigation into KSL is necessary. The author proposes doing research to investigate strategies aimed at improving the utilization of KSL in teaching practices, with the goal of enhancing the academic achievement of learners with hearing impairments. Bunyasi (2010) echoes these viewpoints, highlighting the desirability of teachers' skill and experience in Kenyan Sign Language (KSL), as well as the inadequacy of resources for the education of learners with hearing disabilities in schools. The present study was thus valuable in examining the impact of KSL proficiency on academic achievement in the western region of Kenya. Table 1.1 displays these research and Regional Education Office reports from 2013 to 2017 showing low academic achievement for hearing-impaired KCPE learners.

**Table 1. 1: KCPE Results from 2013-2017**

<b>YEAR</b>	<b>MEAN SCORE</b>
2013	208.3
2014	217.2
2015	202.5
2016	209.0
2017	206.8
<b>Overall Mean</b>	<b>208.76</b>

**Source: Western Region County Education office in Western Region**

Table 1.1 indicates that the average academic performance of the pupils over the years is below the average of 250 marks. Despite the substantial funding by government finances to special schools, through specific training of instructors, and the supply of learning materials, special schools continue to produce subpar results. The purpose of the present study was to establish a connection between mastery of Kenya Sign Language and academic performance of hearing impaired learners in western Kenya.

## **1.2 Statement of the Problem**

Since attaining independence, Kenya has formulated several policies and working papers pertaining to the education of learners with disabilities. The 2018 Sector Policy for Learners and Trainees with Disabilities is one of these policies. However, learners with hearing impairment continue to exhibit substandard academic performance. Numerous studies undertaken within the last forty years have unveiled that deaf learners exhibit significantly diminished levels of reading comprehension, literacy proficiency, and overall scholastic achievement in comparison to their hearing counterparts (Qi & Mitchell, 2012). Despite the government's commitment to guarantee equal access to education for all children, this situation has persisted. A minority of Kenyan schools accommodate learners with hearing impairment on account of a variety of familial and community-level circumstances. Due to the fact that education is a critical driver of economic expansion, the problem of inadequate academic achievement poses a substantial obstacle for any country. Given the circumstances, the purpose of this research is to establish the relationship between the mastery of Kenya Sign Language by teachers and learners on academic performance of learners with hearing impairment in selected primary schools in Kenya.



### **1.3 Purpose of the study**

The purpose of this study is to establish the effects of mastery of Kenyan sign language by teachers and pupils on academic performance of pupils with hearing impairment in selected primary schools in Western Region, Kenya.

### **1.4 Specific Objectives**

- i. To determine the relationship between interpretation of KSL on academic performance of learners with Hearing impairment in Western Region, Kenya
- ii. To establish the relationship between learners' literacy in KSL on academic performance of learners with hearing impairment in Western Region, Kenya
- iii. To find out the challenges faced by learners with HI in their use of KSL in Western Region, Kenya

### **1.5 Research hypotheses**

The study sought to test the following null hypotheses:

**HO<sup>1</sup>:** There is no significant relationship between interpretation of KSL by learners with HI and their academic performance in Kenyan Primary schools.

**HO<sup>2</sup>:** There is no significant relationship between literacy level of learners with HI in KSL and their academic performance.

**HO<sup>3</sup>:** There is no significant relationship between challenges faced in the use of KSL and academic performance of learners with HI.

### **1.6 Significance of the Study**

A diverse range of education stakeholders will find this research on the correlation between proficiency in Kenya Sign Language and academic achievement among learners with hearing impairment to be extremely beneficial. The study will impact policy and practice

regarding the education of learners with hearing impairments. Educators and policymakers can be informed by the findings regarding the use of KSL with HI learners, and the need for improved training for teachers who deal with these learners can be underscored. The research emphasizes the difficulties encountered by learners when sign language is employed as the instructional medium, as well as the subsequent effect on their academic achievements.

The study additionally furnishes insights to key stakeholders, including the Ministry of Education, regarding strategies to improve learners' proficiency in KSL, a factor that directly influences their academic achievement. This research provides additional support for subsequent investigations in the same domain.

### **1.7 Scope of the Study**

The scope of the study was determined by a certain population, geographical location of the study, study characteristics, and technique employed. This research was conducted at public special needs elementary schools in the Western region of Kenya with learners with hearing impairment. In terms of the parameters, the following themes were employed (a) learners' KSL interpretation (b) learners' literacy in KSL and (c) challenges faced by learners with hearing impairment in the use of KSL. The emphasis of the study was on public special needs primary schools in Western Kenya that aid learners with hearing impairment. The questionnaires and interview schedules served as data collection instruments.

### **1.8 Assumptions of the Study**

These are facts that are assumed to be true but have not been independently confirmed (Mugenda & Mugenda, 2003). The study will presume the following.

- a) The respondents will give accurate data,
- b) KCPE is a reliable tool of measurement of academic performance,
- c) Resources are available and used and

### **1.9 Theoretical Framework**

This study employed the social learning theory proposed by Albert Bandura in 1977, which posits that learning and behaviors occur through the processes of observation, modeling, and imitation of others. The primary feature of social learning theory is in the central role of observational teaching. This theory posits that knowledge acquisition occurs through interpersonal interactions within a social milieu. Individuals acquire similar behaviors through the process of observing and imitating the actions of others. Individuals tend to adopt and replicate the conduct of others following their observations, particularly when these observations are characterized by favorable experiences or involve incentives associated with the observed behavior. Bandura posits that imitation encompasses the physical replication of motor movements that have been witnessed. (Bandura, 1977).

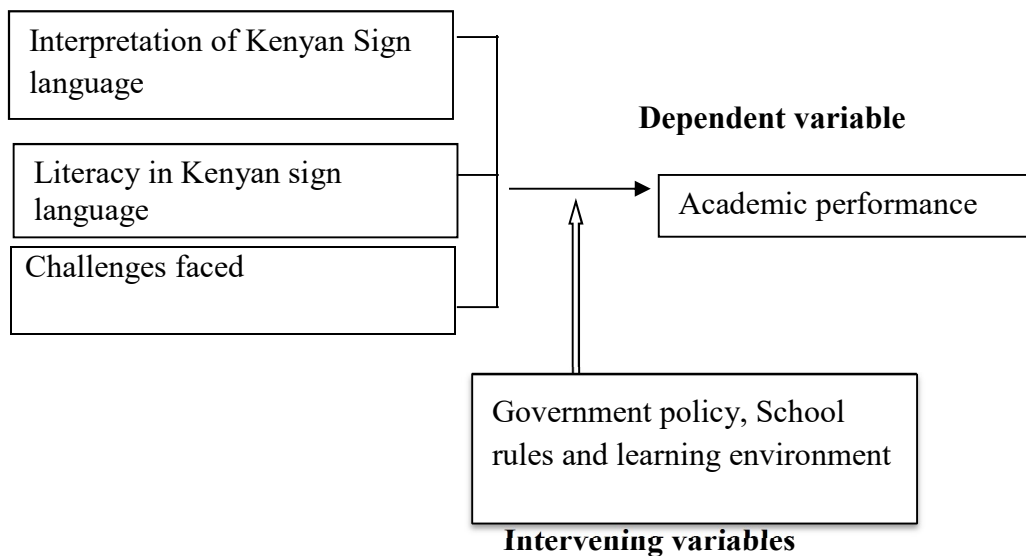
This hypothesis has the potential to enhance the academic performance of hearing impaired learners through numerous means, such as the utilization of peer role models who have achieved notable academic success. Through the process of observing and engaging with accomplished peers, individuals may find themselves inspired to adopt similar study habits, tactics, and positive attitudes towards the pursuit of knowledge. Educators have the capacity to embody exemplary learning processes and behaviors, so serving as role models for their learners. By exemplifying efficacious pedagogical approaches and efficient study strategies, instructors might furnish valuable illustrations for these learners to emulate. In order to enhance the accessibility of academic information for learners, it is recommended to employ video demonstrations and instructional materials presented in sign language. These resources can function as exemplars for acquiring and comprehending scholarly principles. Engage parents and caregivers in the educational process by equipping them with materials and ways to facilitate their child's learning at home. Parents have the ability to serve

as role models in emphasizing the significance of education and establishing a favorable domestic atmosphere that fosters learning.

### 1.10 Conceptual Framework

This research was conceptualized based on the variables that were used as illustrated in the figure 1.1. In the framework it was conceptualized that high academic performance results from mastery of Kenyan sign language described in terms of interpretation, literacy and competency in KSL. The independent variables are: Interpretation of KSL, literacy in KSL and challenges faced by learners is KSL use while the dependent variable is the academic performance. We have also intervening factors which are not part of the study but have an effect on the study variables. In this study they are government policies, school policies and the learning environment as shown in Figure 1.1.

#### Independent variable



**Figure 1. 1: Conceptual Framework Model**

**Source: Researcher (2022)**

## 1.11 Operational Definition of Key Terms

<b>Academic performance:</b>	In this study, the word was interpreted to refer to pupils' performance as judged by their most recent exam scores.
<b>Challenges faced by learners:</b>	Difficulties and hardships learners with HI go through when learning.
<b>Disability:</b>	It's a setback to the person's capabilities that comes as a result of an impairment.
<b>Hearing: Impairment:</b>	These are learners with substantial limitation in present functioning of hearing.
<b>Impairment:</b>	Impairment of the normal operation of an organ or other biological structure.
<b>Interpretation of KSL:</b>	Translation of manual signs often physically produced by hands and other parts of the body combined with non-manual signs to make a meaning in KSL.
<b>Kenya sign Language:</b>	A particular sign language of deaf community in Kenya.
<b>Literacy in KSL:</b>	Ability to read write and comprehend in KSL
<b>Mastery of KSL:</b>	Having a comprehensive knowledge and skill in the use of KSL.
<b>Negative culture:</b>	Bad practice done over time to the extent of being accepted.

<b>Stereotype:</b>	A widely held and oversimplified fixed opinion that learners with HI are weak academically.
<b>Western Region:</b>	One of the former provinces of Kenya prior to 2013 which was referred to as Western Province and was replaced by the counties of: Kakamega, Vihiga, Bungoma and Busia.
<b>Special educational needs</b>	a legal definition and refers to children with learning problems or disabilities that make it harder for them to learn than most children the same age.
<b>hard of hearing</b>	Refers to people with hearing loss ranging from mild to severe. People who are hard of hearing usually communicate through spoken language and can benefit from hearing aids, cochlear implants, and other assistive devices as well as captioning

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter presents information on the concept of academic achievement among learners with hearing impairment, and how the two variables of the study are related. This topic is extensively covered under the following sub-headings; how Kenyan Sign Language is used in facilitating communication and education for learners with hearing impairment, influence of mastery of the sign language on academic performance of learners with hearing impairment and types and nature of the difficulties faced by teachers and learners in using the sign language.

#### **2.1 Sign language**

Sign languages are established in every region of the world where Deaf communities dwell. Many individuals historically believed that sign languages were manual versions of spoken languages, whilst others saw sign language as a collection of meaningless movements used to suppress it in various ways. The lecturer at college concentrated on spoken sign language activities. Some people attempted to create new signature procedures, such as English signed or English coded manually. Smith (2000) recommended parents of children with hearing difficulties not to promote or even allow their children to use signs because they were unable to master speech and lip reading skills.

Presently, there is widespread consensus that sign languages do not serve as literal translations of languages. Their complex spatial grammars differ substantially from those of these groups' primary spoken language. According to Genius (2010), professionals learnt many sign languages and discovered that each language feature was assessed as valid. In

some ways, sign language differs linguistically from spoken English. The naming of things, objects, and processes varies in more ways than one. Sign language and English are structurally distinct. This is due to the fact that the grammatical structures and methods for both languages are completely different. According to Wakumelo and Miti (2010), for instance, facial emotions, body language, and hand forms and movements can all be used to represent meaning in sign language. They include frameworks and processes that do not use spoken languages and feature grammatical structures that are visually appealing (Sadiki, 2008). In terms of linguistics, Smith (2000) asserts that, contrary to popular belief, sign languages are as rich and sophisticated as any language.

The information will be compressed into two symbols that enable the articulation of a sentence necessitating six words in spoken English. According to Glaser and Lorenzo (2010), learners will get a comprehensive understanding of the structure and processes of sign language, which will enable them to establish a connection with the distinctive features of the English language. The research findings indicated that the incorporation of Kenyan Sign Language into the educational curriculum was insufficient in the institutions under study, particularly in terms of the allocation of human resources dedicated to promoting its usage. Those findings are supported by Mukangu (2008) who discovered that teachers with hearing impairments are not appropriately available in schools for learners with hearing impaired learners who would act as role models for HI learners.

The researchers' findings on human capital align with the conclusions drawn by MOE (2009) within the framework of national policy for individuals with special needs. The research results pertaining to Capacity Building and Creation of Human Resource have



substantiated the need for additional personnel in educational institutions, including teacher aides, parents, sign language interpreters, and readers. The programs implemented by these experts exhibit a disregard for the school system, which can be attributed to either inadequate preparation or insufficient allocation of cash for their remuneration.

## **2.2 Academic performance of learners with HI**

Hearing impairment refers to a condition characterized by the partial or complete inability to perceive sound through the auditory system. When the degree of loss is minimal, perceiving weak or distant sounds becomes challenging for individuals. A hearing aid can be utilized by individuals with a wide range of hearing impairments to amplify sounds. Individuals with severe hearing loss experience an inability to discern auditory stimuli. According to Morere (2013), hearing deficit refers to a change in an individual's auditory ability.

### **2.2.1. Global Perspective**

The 2005 Global Monitoring Report titled "The Quality Imperative" focused on the significance of quality and introduced a conceptual framework for a quality system that played a fundamental role in education and learning (UNESCO, 2005). The paradigm pertaining to school-based effectiveness researchers in this context has a notable resemblance (Scheerens, 2000). In summary, the aforementioned structures serve as representations of learner components, inputs, systems, and broader contexts, with the ultimate aim of attaining desired learning outcomes within educational settings and processes. The findings can be described in relation to individual accomplishments in cognition and attitude, as well as the societal advantages, such as economic advancement, human progress, and social unity. These diagrams illustrate the necessity of improving education and learning as the foundation for efforts to enhance the quality of education.

Simultaneously, they emphasize the importance of considering various factors that contribute to the improvement of teaching and learning, including feedback, teacher competence, educational management, and school-community relationships. The academic performance of HI learners equally comes into play like all other learners. The present study present study establish a connection between the mastery of Kenya sign language and academic performance of HI learners.

According to Qi and Mitchell (2012), despite encouraging advancements in the field of education for deaf and hard-of-hearing (DHH) learners, their academic performance remains below that of their hearing counterparts, and a significant number of them fail to attain the necessary knowledge and abilities to maximize their capabilities. Moreover, this research conducted in the United States of America identifies a number of causes for this persistent and disturbing underachievement. A considerable number of DHH learners enroll in school with limited proficiency in either a spoken or signed language. Service providers often face difficulties in effectively organizing language environments and ensuring that DHH children have access to learning opportunities. The research examined a variety of factors that contribute to DHH learners' poor academic performance. The present investigation aimed to ascertain the relationship between sign language interpretation and the academic achievement of learners with hearing impairments.

### **2.2.2. Regional Perspective**

The Seventeenth Annual Report to Congress (1995) from the United States Department of Education states that over 5 million children between the ages of birth and 21 received special education and related services in public schools across the country during the 1993–1994 school year. All of these children were labelled with disabilities that made it harder for

them to learn. Each child with special needs who is old enough to attend school has an Individualized Education Program (IEP) that details and guides the special education services the school provides. Bullocks (1992) points out that questions about specific needs of disabled learners and how school personnel adequately and skillfully handle those needs are difficult questions with nuanced solutions, for example, for a student with a learning disability that may be different from a student with a different disability-succeeding. The magnitude of a student's condition would also impact how the student is assisted and taught by the educators. Thus the study sought the relationship between Kenya sign Language and academic performance.

Morere (2013) used the Woodcock-Johnson III (WJ III) subtests for reading fluency, writing fluency, academic knowledge, and mathematics fluency to examine the academic performance of DHH college learners. While the research was conducted with learners from Gallaudet University, subtests from the WJ III Tests of Achievement, the same instrument utilized with high school learners, were incorporated. In accordance with age-based norms, the mean scores of 47–49 participants were within the average range, but the score distribution was extremely broad. Due to the difficulty in assessing (and instructing) pupils in a population with such substantial individual differences, this wide variation exists. This study focused on the relationship between learners' and teacher proficiency in Kenyan Sign Language and the academic achievement of learners with HI.

Hoofmeister, (2000), found that it is essential for teachers to understand the specific impairments they may encounter in the classroom, how those disabilities may affect their learners' learning and conduct, and what kinds of education and accommodations have been shown to be effective for those disabilities. Special educators have more than simply

questions to respond. Teachers, administrators, and support staff who have not studied special education or the subject of disability are wondering how to best serve the needs of impaired kids as more of these learners enroll in regular classes. This study established the relationship between the learners' and teachers' mastery of Kenya sign language and the academic achievement of learners with HI.

Fortunately, there is a wealth of information available to managers and general and special educators. NICHCY is building a bibliography to assist all learners interested in disability education and care in recognizing some of the numerous available services. The majority of these bibliographies focus on services for a specific condition (for example, learning disability or emotional disorder). This particular bibliography focuses on a variety of tools that investigate diverse disabilities, encompassing chapters that address the individualized needs of pupils with each handicap. While the main focus of these services is not specifically on hearing impairment, they can still offer assistance to individuals with hearing impairments, particularly general educators. These educators provide extensive information on the specific learning needs of learners with hearing impairments and their distinct disabilities.

### **2.2.3. Local Perspective**

MoE, (2012) notes that schools across Kenya performed below average in the national examinations and ran into the last lowest with average performance at 131 out of a possible 500 when ranked with other public hearing schools. The culture and acceptance of failure has been developed among the Deaf pupils and in society. This necessitated the current study to establish the performance of learners with HI.

According to Moores (2001), the prioritization of teaching hearing-impaired (HI) learners' communication skills and other specialist courses has resulted in the neglect of traditional subjects like Mathematics, sciences, and social studies. This trend was observed between 1958 and the 1980s, during a period when HI learners were not required to take standardized national examinations. Moore posits that various factors contribute to the subpar performance of learners, including teachers' attitudes, insufficient commitment on the part of teachers, limited knowledge of sign language, and inadequacies in some subject areas.

Mwanyuma (2016) did a study on Sahajanand School for the deaf in Kiambu on factors affecting academic performance of deaf learners and concludes that the present curriculum does not cater for all learners with special needs in terms of its content. Further, it was observed that the HI learners are allocated a reduced amount of time to academic courses. Hence, it is crucial for these learners to be allocated sufficient time to engage in all learning activities in order to improve their academic performance. The current study looks at the mastery of sign language by teachers and learners on academic performance of the HI learners.

## **2.3 Effect of Literacy in KLS and academic achievement.**

### **2.3.1. Global Perspective**

Countries that have implemented national sign language as the primary mode of instruction in schools for the Deaf have noted unprecedented advancements in the field of Deaf education. 1995 marked the transition to Swedish sign language as the official language of instruction and teaching in Sweden (Chupina, 2006). Subsequently, both regular and special institutions have implemented the identical program, which incorporates sign language.

Academic instruction in sign language and written Swedish is provided by deaf learners in institutions. This resulted in the academic accomplishment of the learners.

Smith and Ramsey (2004) detailed the thirty years of classroom experience of a deaf educator. The instructor converted the fifth classroom of a residential school into an instructional setting by utilizing American Sign Language (ASL). An examination of three courses unveiled the implementation of ASL linguistic features as a means to encourage student engagement. Their research revealed that significantly more learners were actively engrossed in learning in classrooms led by experienced, fluent sign language instructors.

The acquisition of reading skills is achieved via the implementation of a sign language, and effective teaching necessitates the use of a preexisting language (Gerner de Garcia, 2003; Goldin-Mowery & Mayberry, 2001; Wilbur, 2000). Reading requires two distinct yet interdependent skills: (a) proficiency in the target language and (b) comprehension of the ways in which ideas from one language correspond to those from another (Chamberlain & Mayberry, 2000; Goldin-Meadow & Mayberry, 2001; Luckner et al., 2005/2006). A comprehension level that falls between "the language you know" and that of print is required for the mapping process (Goldin-Meadow & Mayberry, 2001, p.226). The primary sign language used with deaf children is always that language.

Learning oral and physical conversational language is a common obstacle for deaf children, which hinders their ability to read and write. A significant proportion of these children were born to non-signing hearing parents, with whom they have no means of communication. Furthermore, it is common for them to be in the company of non-signatories, such as instructors, pupils, family members, and peers (Musselman, 2000). During this time, the

ability to communicate facilitates environmental exploration and literacy acquisition (Kuntez, Golos & Enns, 2014). By learning sign language from an early age, deaf children gain the ability to communicate with others. In order for deaf children born to hearing (non-signing) parents to acquire language normally, they must be exposed to a trained deaf signatory at an early age. The acquisition of literacy proficiency is facilitated through the deaf learning process of reading, which additionally involves language acquisition. When English is a second language and sign language is the native tongue, the bilingual method is optimal (Gentry & Martin, 2014).

### **2.3.2. Regional Perspective**

Mulonda (2013) in his study on a situational analysis on the use of sign language in the education of the deaf in Zambia, wanted to provide a baseline information on the current practices in the education for the deaf which are used to guide policy on language and education for the deaf. The study was carried out in two schools located in the Eastern Province and the Copper Belt Province of Zambia and the target population included, deaf pupils, teachers in deaf schools and units in Zambia, lecturers from Zambia Institute of Special Education (ZAMISE) and University of Zambia (UNZA), standard officers, curriculum specialists in special education, NGOs working with the deaf and parents of deaf children. He used a case study design and the findings of the study, showed that many teachers had not received adequate training in sign language. The study found that sign language was the main medium of communication to both the teachers and the pupils and that it seems that there is no policy on the teaching of sign language to guide the teachers as was seen from the responses. The teachers' views were supported by the curriculum specialist for the hearing impaired, who stated that there was need to introduce sign language as an examinable subject (Mulonda, 2013). The present study sought to establish effect relationship between HI learners' literacy levels of KSL and academic performance.

### **2.3.3. Local Perspective**

Since 2004, KSL has been designated as the official language of instruction in Kenyan schools. It is imperative that language learning institutions incorporate KSL instruction from the outset (MoE, 2009a). The educational institution provides handbooks for written words and new signals to represent new concepts, as well as instruction on their communication. While they are at home, they are provided with signals. Currently, KSL instruction is conducted concurrently with English as a subject. Although it is composed in the English language, its structure exhibits significant deviations from that of English (MoE, 2009b).

Eagly and Chicken (2003) contend that attitude can be defined as an inherent inclination or propensity to react favorably or unfavorably towards a specific concept, entity, individual, or circumstance. Teachers play a crucial role in facilitating the effective integration of Sign Language within educational settings catering to learners with hearing impairments. The academic achievement of learners can be significantly hindered by the talents and attitudes of their teachers. The attitudes of teachers that do not encourage the utilization of Sign Language encompass fear, restricted expectations, and a deficiency in signing proficiency. The lack of knowledge among teachers regarding disabilities frequently leads to subpar academic achievement within the classroom setting.

Mwanyuma (2016) argues that the majority of learners with HI can be instructed in the steps required to improve their communication skills, despite the difficulty involved. Learners with HI benefit most from outside of the classroom engagement and active participation. This approach potentially represents the most efficacious means of ensuring that the student is instructed in proficient communication techniques and attains favorable outcomes (MoE,



2009a). Marschark et al. (2009) indicates that learners who encounter difficulties in reading, writing, and linguistics are less likely to encounter both formal and informal language. HI children struggle to comprehend spoken English and perform better in arithmetic than in reading and writing (Friend, 2008; Morenzo-Perez & Rdriguez-Qrtiz, 2015). The act of receiving and subsequently comprehending (interpretation) a message or informational content constitutes receptive communication. Hence, it is incumbent upon educators to develop approaches that ensure the accessibility of their teachings for pupils who have hearing impairments. Engaging in concurrent communication with multiple individuals enables learners to discern nonverbal signals that might otherwise elude them, including body language and tone of voice. Academic performance can be enhanced through the use of oral, aural/oral, manual, bilingual, whole communication, sign language, and signed English communication strategies, according to KSDC (2000). According to Adoyo (2004), and Kochung (2003), a significant proportion of HI instructors struggle to succeed because they are unable to effectively communicate with their learners. As a consequence, the learners are deprived of critical information that could potentially improve their academic performance.

Further elaborating, Warnke (2007) states that Kenya has made swift strides since KSL is now a criterion for evaluation in elementary and secondary institutions for the deaf in Kenya. While this represents some degree of advancement, its execution has been shoddy and hastily executed. Effective implementation necessitates extensive research into KSL as a written language that is significantly influenced by English; he believes that a lack of fluency in the writing of a hearing language is the greatest obstacle deaf people face around the world.

Numerous approaches have been devised in an effort to assist deaf children in attaining reading fluency (Kuntze et al., 2014). Acquiring literacy is dependent on the level of language development. For example, since they are exposed to sign language from infancy, children of deaf parents have a comparative advantage on English literacy assessments (Musyoka & Hauster, 2011).

The evidence indicates that individuals with hearing loss experience the greatest challenge in terms of literacy when it comes to reading in English. According to Luckner et al. (2005/2006, p. 444), instructing deaf learners in reading is "an arduous and discouraging process." According to Traxler (2000), the reading comprehension abilities of learners with hearing impairments who successfully complete high school are comparable to those of fourth graders. Conversely, the reading comprehension abilities of learners with hearing impairments who complete middle school are either equivalent to or lower than those of seventh graders (Monreal & Hernandez, 2005). Irrespective of the mode of communication selected, 20% of deaf learners exit institutions that require intermediate literacy (Marschark et al., 2002).

It is evident from the antecedent paragraphs that in order to facilitate the transfer of literacy skills, sign language and English should be utilized with high levels of competency and proficiency throughout a student's education.

## **2.4 Challenges faced by learners and teachers in using Kenyan sign language**

### **2.4.1. Global Perspective**

In a study by Lewis (2009), KSL has been used for HI learning in Kenya in 32 out of 71 institutions. The use of the Kenyan sign language is therefore optimistic. But Owiko (2009)

shows that more research on KSL is required. In order to enhance the teaching efficiency of HI learners, he proposes inquiries into steps to make use of KSL. Bunyasi (2010) reflects these views, revealing that the capacity of teachers in KSL in schools for learners with HI is inadequate and lacks or insufficient support. This leads to the need to examine KSL level education for learners, material / human capital and KSL criteria. The response is what steps have been taken since its 2004 adoption to promote the use of KSL in schools for HI learners.

As a means of education, language collects information that affects diverse aspects of life such as social, moral, and cognitive growth to be obtained and interpreted. Therefore, the loss of hearing and speech is a crucial shortfall for HI learners. These learners use sign language as their first language, based on culture, climate, but they should be taught in their schools in a second language. For these learners, this is a challenging challenge. HI learners around the world have confronted problems with the sign method for their classroom instruction (Kyle & will, 1985).

#### **2.4.2. Regional Perspective**

Some schools do not employ KSL (Ndurumo, 2008), while others have a shortage of HI teachers or HI sign language interpreters, as well as inadequate learning and teaching resources, which researchers have identified as a gap that needs to be filled (Mukangu, 2008; Bunyasi, 2010). Lumumba (2009) claims that teachers are not happy with services and facilities and have a negative effect on the learning process. Boissere (2004), Michaleowa (2001) and UNESCO (2007), note that tools, for example, are crucial to good results, such as textbooks, auditioning aids and writing materials.

These results required the completion of the present study whose aim was to find strategy for learners of KSL as a medium of instruction in schools for learners with HI. The problem is as good as the policy and good guidelines concerning KSL usage in classes for learners with HI, because in these classes we have ample time to prepare the implementation of the policy.

The policy fostered segregation until the 1970s. Most educators assumed that the disparities between children with physical, sensory and intellectual disabilities would not allow the children to engage in common school activities (Advani, 2002). Mentally disabled people were the last to be found in the first college founded in 1934 for the mentally impaired (Mishra, 2000). Consequently, special education services were heavily dependent on voluntary action in earlier periods.

Children need to learn social skills through relationships and friendships. These skills are important for social relationships to evolve later in life (Gifford-Smith & Brownell, 2003). In their behavioral growth, children with different grades of approval, social ability and friendship were found to be different (Gest, Graham-Burmann, & Hartup, 2001; Gifford-Smith & Brownell, 2003). Popular kids, who are much loved by many peers and seldom hated, have many pro-social behaviours; they are more social; they often exhibit actions, including associative play and polite approaches; and are seldom dedicated to violent behaviour. Rejected kids, who are frequently hated and seldom liked, exhibit violent and antisocial conduct (such as bullying or victimization) and their peers view them as arrogant.

Rejected children are more likely than other children to have poor developmental effects. Non-attentional infants, whom their peers neither like nor hate, are not socially noticeable. There is little knowledge about their actions. They are hard to differentiate from their

common peers, apart from a general lack of sociability. In the community of peers contentious children are highly noticeable and exhibit activities that are both common and rejected children. Controversy is not always a matter of concern (Anita et al., 2009).

Peer acceptance levels may influence favorable possibilities (Gest et al., 2001), and friendships offer the foundation for social, psychological, and cognitive development. Typically, children with mutual friends are more social, pro-social, and confident (Hartup, 1996). According to Van Lieshout et al., the quantity of mutual friendships and antipathy is related to peer acceptance and social skills (2004). Typically, children with only friendships (and no antipathies) are socially competent, common, or average (Gifford-Smith & Brownell, 2003). Children with both friendships and antipathies have substantially lower social abilities than those with friendships alone. In general, the status of these children is questioned or rejected. Children with poor social skills demonstrate significant levels of antisocial behavior and are typically shunned by their classmates.

Youngsters who don't make friends or have negative attitudes in the classroom are hardly apparent and have a high level of social isolation. These children are generally neglected. According to these studies and evaluations, peer approbation, social skills, and friendship are interrelated. While peer acceptability, social skills, and friendship bonds have already been researched in deaf children, further research is needed (Klubin et al., 2002; Nunes et al., 2001). In addition, no recent research has investigated these interrelationships across time. This study sought to examine the consistency of these variables and their interrelationships across time for both hearing and deaf pupils.

Children's friendships have an impact on not just their social and behavioral growth, but also on their academic performance (Gifford-Smith & Brownell 2003; Johnson 2000). Children who have more friends tend to have an easier time adjusting to school, a higher sense of self-worth, less feelings of isolation, higher levels of peer acceptance, a more positive outlook on school, and higher levels of academic success (Gifford-Smith & Brownell, 2003). Youngsters who are bullied by their classmates are more likely to drop out of school.

### **2.4.3. Local Perspective**

In Kenya, different modes were employed in the 1970s and 1980s, for instance Signed English (SE), Signed Exact English (SEE), and Absolute Contact (TC), but the learners would be referred back to KSL to clarify the concepts. The Ministry of Education (MOE), as such, has embraced KSL as a better means of preparation.

Pellegrini (1992) found that kindergarteners' social interactions with their classmates boosted their performance in first grade. Wentzel, Barry, and Caldwell (2004) discovered that high school learners with mutual friends were more successful academically than those without. Hatzichristou and Hopf (1996) found that rejected children had learning difficulties and performed poorly in elementary and secondary schools. Diehl Lemerise, Caverly, Ramerly, and Roberts (1998) discovered that pairs and friendships greatly improved the prediction of race, gender, school attitudes, and age of 1 to 3 children. Famous youngsters with at least one friend had the most successful school transfer.

This section of the research focuses mostly on the social integration of deaf and hearing learners in an educational context. Using peer reviews and nomination tasks, the deaf children's peer acceptability, social skills, and pleasant connections will be compared to

those of their hearing classmates. Peer evaluations and peer appointments have been used to evaluate the peer acceptability of deaf children in open programs, but less frequently to evaluate social skills and friendship bonds. The majority of research on social skills in deaf learners has been conducted utilizing studies conducted by deaf learners themselves. While self-reports give objective evidence, learners' perceptions of their own social abilities may differ significantly from those of their classmates. Friendship connections have not been thoroughly studied. Most studies only consider the amount of nominations a deaf child can receive, rather than the degree to which the nominating child is loved by the deaf child. Nunes et al. (2001) conducted the sole study that looked into the phenomenon of reciprocal nominations. Yet, it was understood that a child was invited to play at your house based on their nominations, rather than that the child was your companion. The paper delves deeper into the topics of sociability and friendliness.

This article investigates the associations between gender, open structures, grade level, cochlear implant use, peer acceptance, social competency, and friendship relationship, given that relationships have been identified between social integration and characteristics such as gender (Van Lieshout et al., 2004), grade level (Gifford-Smith & Brownell, 2003), and mainstream setting (Van Lieshout et al., 2004). (Musselman et al., 1996). We will also look into how well deaf children do in school if they are able to communicate with their hearing peers. Hearing children have been studied in this connection, but deaf children have not.

## **2.5. Research Gaps**

Morere (2013) used the Woodcock-Johnson III (WJ III) subtests for reading fluency, writing fluency, academic knowledge, and mathematics fluency to examine the academic performance of DHH college learners. Qi and Mitchell (2012), notes that despite

encouraging advancements in the field of education for deaf and hard-of-hearing (DHH) learners, their academic performance remains below that of their hearing counterparts, and a significant number of them fail to attain the necessary knowledge and abilities to maximize their capabilities. Mwanyuma (2016) did a study on Sahajanand School for the deaf in Kiambu on factors affecting academic performance of deaf learners and concludes that the present curriculum does not cater for all learners with special needs in terms of its content. The research examined a variety of factors that contribute to DHH learners' poor academic performance. The current study sought to determine the relationship between sign language interpretation and academic achievement in pupils who have hearing impairments.

Mulonda (2013) used a case study design and the findings of the study, showed that many teachers had not received adequate training in sign language. The study found that sign language was the main medium of communication to both the teachers and the pupils and that it seems that there is no policy on the teaching of sign language to guide the teachers as was seen from the responses. Eagly and Chicken (2003) looked at the teacher attitude on the use of sign language. The study concluded that academic achievement of learners can be significantly hindered by the talents and attitudes of their teachers. Warnke (2007) studied the extent of sign language implementation. The study found that that Kenya has made swift strides since KSL is now a criterion for evaluation in elementary and secondary institutions for the deaf in Kenya. Oracha (2007) sought to know the effect of sign language on school activities. He concluded that teachers must master Sign Language Structure before she/he develops Signing Skills that will be used at all times for proper learning to take place in the classroom. Sign Language therefore plays a pivotal role that affects all activities in the



school. The present study sought to establish that relationship between learners literacy in KSL on academic achievement of HI learners.

Bunyasi (2010) investigated KSL criteria, material and human capital, and learners' KSL level of education. The findings of the study indicate that there is a deficiency in the proficiency of teachers in KSL inside educational institutions catering to learners with hearing impairments. Furthermore, it is evident that the level of support provided to these teachers is insufficient. Ndurumo (2008) highlighted that some schools do not employ KSL, while others have a scarcity of HI teachers or HI sign language interpreters, as well as insufficient learning and teaching materials. According to Lumumba (2009), teachers express dissatisfaction with the quality of services and facilities, which in turn adversely impacts the learning process. Boissere (2004), Michaleowa (2001), and UNESCO (2007) point out that some tools—like writing materials, audition aids, and textbooks—are essential for achieving successful outcomes. The current study sought to establish the challenges faced by learners with HI in their use of KSL.

## CHAPTER THREE

### RESEARCH DESIGN AND METHODOLOGY

#### 3.0 Introduction

This section explores data collecting, analysis, and presentation strategies. It discusses in detail the research design, study location, target population, sample size and sampling techniques, data collection instruments, data collection protocols, pilot study, data reliability and validity, ethical issues, data analysis, and presentation methods.

#### 3.1 Research Design

A research design is a collection of techniques and strategies for gathering and analyzing the variables specified by the research challenge (Creswell, 2014). Considering the purpose of this study was to examine the relationship between knowledge of Kenya sign language and academic achievement of learners with hearing impairment in special education institutions, it was considered that an ex post facto study was the most suitable research design to address the research questions and test the hypotheses. Ary et al. (2010) emphasize that an ex post facto research strategy is beneficial when investigating the link between dependent and independent factors when randomization or modification of the independent variable is impossible. Ex-post facto studies, also known as post-event investigations, are a type of investigation design in which the inquiry commences subsequent to the occurrence of the event, independent of the investigator's presence. Ex post facto research designs comprise the majority of social science when manipulating the characteristics of human participants is either impossible or unacceptable. Furthermore, it is frequently utilized in lieu of authentic experimental investigations to examine hypotheses regarding cause-and-effect connections or in circumstances where implementing the complete protocol of a true experimental design

is impracticable or unethical. Ex post facto research, despite examining past events, exhibits certain similarities in its fundamental research logic with the experimental research design.

### **3.2 Location of the Study**

The research was conducted in the Western region of Kenya. The region includes the four counties of Kakamega, Busia, Vihiga, and Bungoma. Location: between 20°N and 30°S and 330°E and 350°E in the equator. The main economic activity is farming, and the average elevation is about 1800 meters above sea level. The Kenya National Bureau of Statistics (2019) estimated a total population of 5.02 million for the area (Bungoma, 1.671 million; Kakamega 1.867 million, Busia 0.893 million and Vihiga 0.590 million). There has been an uptick in economic activity in the western part of Kenya. The study location was selected due to its persistently low academic performance and the existence of schools for learners with hearing loss.

### **3.3 Target Population**

According to Table 3.1, this study targeted a total of 12 Head Teachers, 93 sign language teachers, and 108 Pupils in grades seven and eight from 12 public primary schools for learners with HI in the region.

**Table 3. 1: Target Population**

<b>Stratum</b>	<b>Target population</b>
<b>Pupils</b>	108
<b>Teachers</b>	93
<b>Head teachers</b>	12
<b>Total</b>	213

**Source: Kakamega County Director of Education, (2018)**

### 3.4 Sample Size and Sampling Procedure

The study adopted a saturated sampling. The study included all of the participants despite the modest numbers of teachers, learners, and head teachers. Gay (1992) notes that the sampling error decreases as sample size increases. Table 3.2 depicts the sample size.

**Table 3. 2: Sample size**

<b>Stratum</b>	<b>Target population</b>	<b>Sample size</b>
<b>Pupils</b>	108	108
<b>Teachers</b>	93	93
<b>Head teachers</b>	12	12
<b>Total</b>	213	213

### 3.5 Data Collection Instruments

Unstructured interviews and questionnaires were employed to acquire the data. The interview schedules were disseminated to principals, whereas the questionnaires were distributed to instructors and learners. Both pieces of apparatus were employed to perform data triangulation.

#### 3.5.1 Questionnaire

This is among the most essential instruments used for data collection. The researcher efficiently gathered data through the administration of a questionnaire, as a significant portion of the material was succinctly explicated in written form. For many, questionnaires offer a more economical and time-saving alternative (Wekesa, Namusonge & Nambuswa, 2017). Questions with closed-ended responses comprised the questionnaires. The implementation of these limitations hindered participants from divulging superfluous information and expedited the process of gathering data. As certain participants sought clarification, the

researcher administered the questionnaire to the learners and instructors with the aid of a study assistant who was proficient in sign language.

The questionnaires used a Likert scale for scoring the instruments. Each question contained five options from which responders were required to select only one. The choices available for selection included: Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. The choices were scored as follows: Strongly Agree = 5, Agree = 4, Undecided =3, Disagree = 2, Strongly Disagree = 1. Minimum score was 3 (three) and maximum score was 15 (fifteen) when measuring the influence of KSL interpretation on academic performance and the problems learners confront while using KSL (fifteen). Negative influence was inferred by scores between 0 and 2.4, ambivalent influence by values between 2.5 and 3.4, and positive influence by scores between 3.5 and 5. The group of ambivalence was entrusted with the care of the intermediate group.

The scoring method used to determine the impact of KSL learners' literacy on their academic performance was also based on a five-point scale with four components. Minimum score was four and highest score was twenty (twenty). Negative influence was categorized as 0 to 2.4, ambivalence as 2.5 to 3.4, and positive effect as 3.5 to 5.

### **3.5.2 Interview Guide**

Data from head teachers was also gathered using the interview schedule. The goal of a research interview is to learn about people's perspectives, experiences, views, and/or motives on specific issues (Gill et al., 2008). The interviews were designed to "deepen" the researcher's understanding of the impact of KSL on learners' academic achievement. Unstructured interviews were used. According to McLeod (2014), unstructured interviews

allow the researcher to gain a thorough grasp of how a person perceives a problem. The researcher utilized open-ended questions that could be asked in any order depending on how the interview progressed.

### **3.6 Data Collection Procedures**

The researcher did a pre-visit to earn the respondents' confidence and trust. Teachers and learners were then given adequate time to complete the data collecting tools, while the researcher also conducted interviews with the school administrators.

The pupils were given self-administered questionnaires at opportune times in the schools; the researcher then clarified each question as the learners selected the most suitable response. Facilitating communication with pupils who had hearing impairments was a teacher who possessed specialized knowledge of Kenyan Sign Language. The subjects were administered the questionnaire at different time intervals, in accordance with their availability. After the respondents had finished the questionnaire, the interviewee proceeded to engage in discussion-based individual interviews with the head instructors.

### **3.8 Validity of Research Instruments**

Brains and Manheim (2011), state that a tool is valid if and only if it measures the elements it purports to measure. That is to say, the features of the test should line up with those of the function it is meant to evaluate. The three main kinds of validity (content, criterion-related, and construct) were discussed. Content validity is the extent to which a measure reflects all characteristics of a certain concept (Wilson et al., 2012). This type of assessment is deemed subjective because it continues to rely on people's perspectives while measuring otherwise difficult-to-measure phenomena.

The present study involved the validation of the instrument, specifically a questionnaire, to ensure that its content and format were congruent with the variables under investigation. In this particular instance, the questionnaires underwent content and face validation with the assistance of supervisors. The instrument underwent revisions based on feedback received from specialists prior to its implementation in the field.

### **3.9 Reliability of Research Instruments**

Instrument reliability refers to the consistency of results when the same instrument is used on several times or administered to different people within a specific group. According to Maree (2007), reliability refers to the degree to which a measurement equipment displays repeatability and consistency. The reliability of an instrument is measured by its ability to consistently produce the same results whenever it is used. The reliability of a measuring tool is its general steadiness (Eisinga et al., 2012). Furthermore, they claim that the measurement is prone to inaccuracy due to any random effect that causes it to vary from one occasion to the next, unless the variations are of a type that maximize systematic variance. Consequently, precision and accuracy are important to the concept of reliability.

The Cronbach's alpha reliability test, which examines internal consistency, and the test-retest test, which examines the questionnaire's stability, were computed to determine the questionnaire's reliability. Internal consistency is a measure of how well a test's items are related to one another and how well they all assess the same underlying notion or construct (Mohsen & Reg, 2011). The closer the Cronbach's alpha reliability coefficient is to 1, the more confident we can be in the reliability of the scale as a whole (Ibid, 2011).

Based upon the formula  $\alpha = \frac{rk}{[1+(k-1)r]}$  where **k** is the number of items considered and **r** is the mean of the inter-item relationships, the size of alpha is determined by both the number of items in the scale and the mean inter-item relationships. In contrast, test-retest reliability is a measure of trustworthiness achieved by giving the same test again to the same people at different times (Colin & Julie, 2006). In order to assess the test's reliability over time, we linked the results from Time 1 and Time 2.

The Cronbach's Alpha value for this investigation was 0.70, indicating the acceptable internal consistency of the items being measured. George and Mallery (2003) provide the following rules of thumb:  $r \geq .9$  – Excellent,  $.9 > r \geq .8$  – Good,  $.8 > r \geq .7$  – Acceptable,  $.7 > r \geq .6$  – Questionable,  $.6 > r \geq .5$  – Poor and  $r < .5$  – Unacceptable. It should also be emphasized that 0.8 alpha is a reasonable target (Ibid, 2003). Mugenda and Mugenda (2003) add that if the coefficient is 0.80 or higher, it indicates that the data is highly reliable. In order to determine the reliability coefficient of the research equipment, a pilot study was undertaken in a special school in neighboring Trans Nzoia County. Once a pilot was conducted, the results were compared to the ideal values suggested by Mugenda and Mugenda (2003) and George and Mallery (2003) and were determined to be within the acceptable range. Hence, the reliability of the questionnaires was established.

### **3.10 Limitations and Delimitations of the Study**

This study was limited by a number of things. It focused primarily on the perspectives and experiences of learners with HI in Western Kenyan schools.



The learners with hearing impairment have linguistic difficulties, the responses required an interpreter who may not reflect their genuine experiences and knowledge, so presenting issues of validity. The interpreter were therefore put on spot to present the actual responses from the respondents.

Location of schools which offer special needs education for the hearing impaired posed logistical challenges in terms of transportation and distribution of questionnaires. The researcher has to extend the time set for the study to reach out on all the listed schools adequately.

The researcher enlisted the services of trained field representatives to undertake data collection process as well as interpretation in order to minimize on time taken.

### **3.11 Data Analysis**

The data obtained was subjected to inferential analysis using the Statistical Package for the Social Sciences (SPSS). These analyses included chi-square tests to examine associations between variables, as well as descriptive analyses to calculate means, frequencies, and percentages. The study yielded both quantitative and qualitative data. The data was presented using tables, percentages, frequencies, and cross-tabulations. These methods were advantageous in the context of characterizing variable distributions, providing concise summaries and organizing data in a coherent manner to facilitate comprehension and the identification of patterns, as well as facilitating the classification of data into meaningful categories.

### **3.12 Ethical Consideration**

Before collecting data, the researcher obtained authorization from the graduate school of Masinde Muliro University of Science and Technology and the National Council for Science, Technology, and Innovation to perform the study. Further, as delineated by Creswell and Creswell (2018), the subsequent measures were implemented in advance of the research to safeguard the rights of the informants. The first concern was about informed consent and voluntary involvement. The research objectives were explained verbally and in writing so that the informant could comprehend them, along with a description of how the data will be utilized. All data collection devices and activities were disclosed to the respondents.

During the actual study, respondents' consent was requested. The consent procedure ensures that persons participate in the research voluntarily and with full knowledge of the risks and benefits (APA, 2020). Consideration was also given to the problem of confidentiality. This meant that only the researcher could link individual participants to their responses, preventing anyone outside the project from doing so. Apart for the numbering used to identify data during data processing, school names were not required to appear on the questionnaires.

Furthermore, the study avoided using terminology like "patients" or "cases" to describe the pupils with hearing loss, as they are condescending and demeaning. The researcher informed the respondents once the investigation and data analysis were completed. This involved conversational sessions centered on the exchange and study of material owned by the researcher so that respondents may check the accuracy of the information. According to

Kiaritha (2020), the researcher would keep study records safe for three to five years for future reference.

## **CHAPTER FOUR**

### **DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION**

#### **4.0 Introduction**

This chapter presents in detail data analysis, interpretation and discussion of the findings of the study. The findings have been presented in context of the research questions and themes of the study. The main objective was to determine the relationship between mastery of Kenyan sign language and academic performance of pupils with hearing impairment in selected public primary schools in western Kenya. Questionnaire responses were analysed using SPSS V20. The instruments had two parts; dealing with general information of respondents and dealing with perceptions of respondents on the relationship between mastery of KSL and academic performance.

#### **4.1 DEMOGRAPHIC INFORMATION OF THE RESPONDENTS**

The study analysed the demographic information of the respondents as obtained from completed questionnaire.

##### **4.1.1 Age of the pupils**

The age of pupils is presented in table 4.1.

**Table 4. 1: Ages of the pupils**

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>Valid</b>	12 Years and below	3	2.8	2.8	2.8
	13 - 15 years	31	28.7	28.7	31.5
	16 - 18 years	63	58.3	58.3	89.8
	19 years and above	11	10.2	10.2	100.0
	<b>Total</b>	<b>108</b>	<b>100.0</b>	<b>100.0</b>	

Table 4.1 shows that 3 learners, or 2.8%, are younger than 12 years old and 31 learners, or 28.7%, are between the ages of 13 and 15. The study additionally unveiled that 63 learners (58.3%) are between the ages of 16 and 18, whereas only 11 learners (10.2%) are 19 years of age or older. The results indicate that the majority of learners, 74 (68.5%), are 16 years of age or older but are still enrolled in grades 7 and 8. This educational delay could be linked to HI.

According to the Ministry of Education (2003), gender disparities have historically afflicted the educational system of the country at both the national and provincial levels. Another drawback is that learners with special needs typically begin their academic careers later than their peers without such requirements. Hard-of-hearing learners in Kenya typically enroll later and remain for a longer duration of time than their hearing counterparts (Ngao, 2005). This is partially attributable to the fact that learners' ages tend to blend more as they advance through school in Kenya, as stated by Lewin and Sabates (2011).

#### 4.1.2 Age of teachers and head teachers

The study sought to know the age of the teachers and head teachers. The results are presented in Table 4.2.

**Table 4. 2: Ages of the teachers and the head teachers**

		Teachers		Head teachers	
		Frequency	Percent	Frequency	Percent
<b>Valid</b>	20 - 30 years	35	37.6	-	-
	30 - 40 years	39	41.9	-	-
	40 - 50 years	18	19.4	8	66.7
	50 years and above	1	1.1	4	33.3
	Total	93	100	12	100

Based on the data presented in Table 4.2, it can be observed that a significant proportion of instructors, specifically 39 individuals or 41.9% of the total, fall within the age range of 30 to 40. Additionally, 35 teachers, accounting for 36.6% of the total, are aged between 20 and 30. The research findings additionally indicated that a total of 19 teachers, including 20.5% of the sample, were aged 40 years and older. In terms of head teachers, all 12 (100%) are over the age of 40.

#### 4.1.3 Gender of pupils, teachers and head teachers

The gender of the respondents is shown in table 4.3.

**Table 4. 3: Gender of the pupils, teachers and head teachers**

	<b>Pupils</b>		<b>Teachers</b>		<b>Head teachers</b>	
<b>Valid</b>	Frequency	%	Frequency	%	Frequency	%
Male	46	42.6	28	30.1	9	75
Female	62	57.4	65	69.9	3	25
Total	108	100.0	93	100.0	12	100.0

According to the data presented in Table 4.3, the proportion of girls with hearing impairment in the public primary schools that took part in the survey is greater than that of boys. Males comprised 42.6% of the pupils in Table 4.3, whereas females comprised 62 (57.4%). The study findings indicate that the number of female primary school teachers in Western Kenya is greater than that of male teachers. In regard to the teaching staff, there are 28 male teachers (30.1%) and 65 female teachers (69.9%) in total. Additionally, it is apparent that 3 (25%) of the chief teachers were female, whereas 9 (75%) were male.

#### **4.1.4 ACADEMIC LEVELS OF TEACHERS AND HEAD TEACHERS**

The academic level of teachers and head teachers is shown in table 4.4. From the table only 6 (6.5%) of the teachers are at P1 level while a significant number 27 (29.0%) have diploma certificates. The study also showed that 52(55.9%) of the teachers have Bachelors degrees while a small percentage of 6 (6.5%) have masters. Only 2 (2.2%) of the teachers have PhD.

**Table 4. 4: Academic levels of teachers and head teachers**

		<b>Teachers</b>		<b>Head teachers</b>	
		Frequency	%	Frequency	%
<b>Valid</b>	P1	6	6.5	5	41.7
	Diploma	27	29.0	2	16.6
	Bachelors Degree	52	55.9	5	41.7
	Masters	6	6.5	-	-
	PhD	2	2.2	-	-
	Total	93	100.0	12	100.0

Generally regarding head teachers, 5 (41.7%) have P1, 2 (16.6%) have diploma and 5 (41.7%) have Bachelor's degree.

#### **4.2 ACADEMIC PERFORMANCE OF LEARNERS WITH HEARING IMPAIRMENT**

Academic performance was measured on a scale ranging from 0 to 500 points. As a result, a score of 200 or less signified very poor academic performance, 201 to 300 represented satisfactory performance, and 301 to 500 represented excellent performance. The researcher looked at the learners' previous exam scores to draw conclusions. Table 4.5 displays the average and standard deviation scores.

**Table 4. 5: Academic performance of learners with HI**

<b>Learners</b>	<b>Gender of the pupils</b>	<b>N</b>	<b>Mean</b>
<b>Learners with HI</b>	Male	46	194.87
	Female	62	203.53
	Total	108	199.23



The results of a statistical analysis conducted on a single sample are presented in Table 4.5. The data indicates that the mean score achieved by the learners was 199.23. Distinguishing by gender, the mean scores of male learners were 194.87 points and those of female learners were 203.53 points. These results suggest that female pupils outperformed their male counterparts.

As a result, a t-test was run to see if there was a statistically significant difference in academic achievement between male and female learners; the findings are displayed in table 4.6.

**Table 4. 6: T-test of mean difference in academic performance between male and female pupils with hearing impairment**

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Male – Female	.50000	.77964	.10812	.28295	.71705	4.625	51	.000

From table 4.6, it was determined that the Sig (2-Tailed) value was 0.000, which is less than 0.05. Hence, the researcher concluded that there was a statistically significant difference between the mean score of male learners and that of female pupils.

### 4.3 Influence of pupils' interpretation of KSL on academic performance

Table 4.7 shows data on the influence of KSL on academic performance according to the pupils.

**Table 4. 7: Influence of KSL interpretation on academic performance according to pupils**

Item	Strongly Agree		Agree		Neither agree nor disagree		Disagree		Strongly Disagree		N	Index
	Count	%	Count	%	Count	%	Count	%	Count	%		
Able to interpret KSL	4	41.7	48	44.4	5	4.6%	5	4.6	5	4.6%	10	4.14
Assign exact English to KSL	2	26.9	47	43.5	18	16.7	10	9.3	4	3.7%	10	3.81
Interpret finger-spelled words during instruction.	2	23.1	51	47.2	14	13.0	8	7.4	10	9.3%	10	3.68
Able to differentiate signed words from finger-spelled words in sentence construction.	3	27.8	49	45.4	10	9.3%	5	4.6	13	12.0	10	3.69
<b>Total Influence of KSL Interpretation on Academic Performance</b>											<b>3.83</b>	
<b>Pupils Rating</b>												

The research findings indicate that a small percentage of pupils, specifically 5 (4.6%), expressed strong disagreement, while another 5 (4.6%) simply disagreed with the notion that the ability to interpret English words in KSL has an impact on their academic performance.

Conversely, a significant majority of participants, comprising 48 (44.4%) individuals, agreed with this statement, while an additional 45 (41.7%) strongly agreed that the ability to interpret KSL does indeed affect their academic performance. Additionally, a total of five individuals, accounting for 4.6% of the sample, expressed indecisiveness. The findings thus underscore the significance of sign language interpretation in the context of education and knowledge acquisition.

In relation to the translation of Kenyan Sign Language (KSL) to Signed Exact English (SEE), the research findings indicate that 29 kids, accounting for 26.9% of the sample, expressed a high agreement with the notion that their proficiency in translating KSL to SEE had a significant impact on their academic achievements. In addition, it was found that 47 individuals, accounting for 43.5% of the participants, expressed agreement with the notion that a student's proficiency in translating KSL signed precise English has an impact on their academic achievement. Conversely, a minority of 4 individuals, representing 3.7% of the respondents, strongly disagreed with this perspective. The study additionally demonstrated that a total of 10 kids, accounting for 9.3% of the sample, expressed disagreement with the notion that their proficiency in translating Kenyan Sign Language (KSL) to signed precise English has an impact on their academic achievements. According to the data presented in Table 4.7, a significant proportion of instructors, namely 42 individuals or 45.2%, expressed a strong agreement with the impact of pupils' capacity to translate KSL (Kenyan Sign Language) to signed accurate English on their academic performance. Additionally, 36 teachers, accounting for 38.7% of the participants, indicated agreement on this matter.

The results of the study indicated that a significant proportion of the learners, specifically 51 individuals (47.2%), acknowledged that their academic performance is influenced by their proficiency in rapidly comprehending finger spelt words during instructional sessions. Furthermore, a smaller subset of 25 learners (23.1%) expressed high agreement with this statement. The study also found that 14 kids, accounting for 13.0% of the sample, expressed uncertainty, while an additional 8 pupils, representing 0.4% of the sample, disagreed with the given statement. The remaining 10 individuals, including 9.3% of the total sample, expressed strong disagreement. Courtin (2000) asserts that a significant number of individuals with hearing impairments acquire proficiency in Korean Sign Language (KSL) while concurrently developing skills in signed exact English and engaging in simultaneous language use. Consequently, these learners have challenges in effectively coordinating these concurrent processes.

The study revealed that a significant proportion of the pupils, specifically 30 (27.8%), expressed a strong agreement regarding the impact of their ability to distinguish between signed words and finger spelled words in constructing sentences on their performance. Additionally, 49 (45.4%) of the participants agreed that this ability has an influence on their academic performance. Conversely, 10 (9.3%) of the pupils remained undecided on this matter. The study also found that a small percentage (4.6%) of the learners expressed disagreement over the impact of their ability to distinguish between words and finger spelt words within sentences on their academic achievement. Thirteen individuals, constituting 4.6% of the sample, expressed strong disagreement.

From the results in table 4.7, the overall index of the Influence of KSL Interpretation on academic performance pupils rating was computed. The mean score was 3.83. When the scores were compared to the scoring procedure, it was established that the scores were under positive category. This indicates that the pupils feel that KSL interpretation influences their academic performance.

Teachers were also asked to give their views on the influence of KSL interpretation on academic performance. Table 4.8 is a summary of the data obtained. From table 4.8, a cumulative 9 (9.7%) of the teachers disagreed that ability to interpret KSL by pupils affects their academic performance while 78 (83.9%) agreed that pupil's ability to interpret KSL affects their academic performance. Notably, through interviews, all the head teachers 12(100%) emphasized the ability to interpret KSL as being key in academic performance. Musyoka and Hauser (2011) noted that evidence from several studies suggest that proficiency in a native sign language result in better English literacy which in turn improves performance. The results indicate both teachers and pupils value translation of Kenya sign language into signed exact English language. The same view is held by head teachers. Patricia (2010) says signed English is a specialized system of signing with standard markers (to indicate inflections, plurals, tense) and generated signs together with finger spelling to produce as accurately as possible the grammatical components of English to enhance teaching of English to the HI.

**Table 4. 8: Influence of KSL interpretation on academic performance according to the teachers**

Item	Strongly Agree		Agree		Neither agree nor disagree		Disagree		Strongly Disagree		N	Index
	F	%	F	%	F	%	F	%	F	%		
Able to interpret English words in KSL.	42	45.2%	36	38.7%	6	6.5%	7	7.5%	2	2.2%	93	4.17
Translate KSL to signed exact English	30	31.3%	37	38.5%	13	13.5%	9	9.7%	4	4.3%	93	3.86
Interpret finger-spelled words quickly during instruction	45	48.4%	27	29.0%	6	6.5%	9	9.7%	6	6.5%	93	4.03
Able to differentiate signed words from finger-spelled words in sentence construction	28	30.1%	30	32.3%	14	15.1%	12	12.9%	9	9.7%	93	3.60
<b>Total Influence of KSL Interpretation on Academic Performance Teachers Rating</b>											<b>3.92</b>	

It was also discovered that 45 (48.4%) of teachers strongly agreed that learners' ability to quickly interpret finger spelled words during instruction affects academic performance,

while 9(9.7%) disagreed, and another 6(6.5%) were undecided and 6(6.5%) strongly disagreed. The majority of the (8) questioned head teachers felt that quick interpretation of finger spelt words has an impact on performance.

Furthermore, 28 (30.1%) teachers strongly agreed that learners' ability to distinguish signed words from finger spelled words in sentence formation influences their performance, 30 (32.3%) agreed, and 14 (15.1%) were undecided. According to the findings, 12 (12.9%) of the teachers disagreed with the statement, while 9 (9.7%) strongly disagreed. The majority of teachers believe that distinguishing between signed and finger written words has an impact on performance. Interviewed principals took the same stance as teachers. According to Gregory et al. (2002), KSL and English should be utilized together with high levels of competency and proficiency, and skill transfer between them should be promoted to improve academic success.

The overall index of the teachers' rating of the impact of KSL interpretation on student achievement was calculated from the data in table 4.8. The average result was a 3.92. Teachers' perceptions that KSL interpretation effects learners' academic achievement were supported by a comparison of their own scores with those generated by a standard scoring rubric.

To see if there is a relationship between the use of Kenya Sign Language interpreters and the success of hearing learners in the classroom, a chi-square analysis was performed. Table 4.9 displays the outcomes.





**Table 4. 9: Relationship between interpretation of KSL and academic performance**

		<b>Below average</b>	<b>Average</b>	<b>Above average</b>	<b>Total</b>	<b>Statistics test</b>
<b>KSL</b>	Disagreed	14(13.0%)	1(0.9%)	0(0.0%)	15(13.9%)	$\chi^2 = 16.297$ , df= 4, p= 0.003
<b>Interpretation</b>	Neutral	14(13.0%)	11(10.2%)	12(11.1%)	37(34.3%)	
	Agreed	22(20.4%)	13(12.0%)	21(19.4%)	56(51.9%)	

The results of the study indicate that within the sample of learners, 15 individuals (13.9%) expressed disagreement over the interpretation of KSL. Within these individuals, 14 (13%) obtained scores below the average in their previous examination, while 1 individual (0.9%) achieved an average score. Furthermore, within the cohort of learners, a total of 37 individuals (34.3%) expressed a neutral stance towards their proficiency in KSL interpretation. Within this subgroup, 14 learners (13%) obtained scores below the average on their last examination, while 11 learners (10.2%) achieved scores that were deemed average. Additionally, 12 learners (11.1%) attained scores above the average. Ultimately, among the total of 56 learners, which accounts for 51.9% of the participants, it was found that 22 individuals, equivalent to 20.4%, achieved scores below the average on their previous examination. Additionally, 13 learners, constituting 21.0%, obtained scores that were considered average, while 21 participants, making up 19.4%, achieved scores above the average.

The obtained data demonstrate a p-value of 0.003. Given that p=0.003 is less than  $\alpha=0.05$  in this particular instance, the null hypothesis H01 is rejected. This suggests that there exists a substantial relationship between the comprehension of Kenyan Sign Language (KSL) by

learners with hearing impairments (HI) and their scholastic achievements in primary schools in Kenya.

#### 4.4 INFLUENCE OF PUPILS LITERACY IN KSL ON THEIR ACADEMIC PERFORMANCE

Data was obtained from the pupils and teachers to determine the influence of pupils' literacy on their academic performance. The results from the data obtained from the pupils are as shown in table 4.10.

**Table 4. 10: Pupils perception on the influence of KSL literacy on their academic performance**

Item	Strongly Agree		Agree		Neither agree nor disagree		Disagree		Strongly Disagree		N	Index
	Count	%	Count	%	Count	%	Count	%	Count	%		
Able to read all English words in a given sentence/paragraph.	39	36.1%	38	35.2%	10	9.3%	13	12.3%	8	7.4%	108	3.81
You normally read and do comprehension based on KSL	35	32.4%	46	42.6%	8	7.4%	10	0.9%	8	7.4%	108	3.81
Use KSL in all your communications	49	45.4%	32	29.6%	9	8.3%	8	7.4%	10	9.3%	108	3.94
There are some signs in KSL that i have not mastered.	58	53.7%	27	25.0%	15	13.9	4	3.7%	4	3.7%	108	4.21
<b>Total Influence of Pupils Literacy in KSL on their Academic Performance Pupils Rating</b>											<b>3.94</b>	

According to the data presented in Table 4.10, a significant proportion of learners (39, or 36.1%) express agreement with the statement that they possess the ability to comprehend and accurately interpret all words inside any given English sentence or paragraph. The findings of the study also indicated that a significant proportion of learners, specifically 35 (32.4%), expressed a strong agreement with the notion that reading comprehension skills in KSL have a direct impact on their academic achievements. Additionally, 46 (42.6%) learners agreed with this statement, while 8 (7.5%) remained uncertain about the relationship between KSL reading comprehension and academic success. Based on the findings, it was found that a mere 8 individuals, constituting 7.4% of the participants, concurred with the notion that their proficiency in KSL reading and comprehension exerted an influence on their academic achievements. Conversely, a total of 10 respondents, accounting for 9.3% of the sample, expressed strong disagreement with this viewpoint. Research findings indicate that kids with hearing impairments exhibit lower levels of reading comprehension skills compared to their peers without impairments. Additionally, it has been reported that approximately 20% of these learners graduate from high school with functional illiteracy (Sebald et al., 2006; Traxler, 2000; Marschark et al., 2002).

The results indicate that a significant proportion of the learners, specifically 49 individuals (45.4%), expressed a strong agreement on the impact of utilizing KSL in their overall communication on their academic achievements. Additionally, 32 learners (29.6%) agreed with this notion, while 9 learners (8.3%) remained uncertain about the matter. The findings of the survey indicate that a total of 8 kids, accounting for 7.4% of the sample, expressed disagreement on the impact of utilizing KSL in all forms of communication on their academic performance. Additionally, 10 pupils, representing 9.3% of the sample, strongly

disagreed with this notion. The research conducted by Aura et al. (2016) and Chupina (2006) further supports the notion that incorporating sign language as a means of instruction has yielded positive outcomes in the education of individuals with hearing impairments. According to Kilanya (2016), the implementation of Kenyan Sign Language (KSL) in schools for the deaf has not resulted in significant improvements in the educational attainment of hearing-impaired learners.

The overall index reflecting the influence of children' literacy in KSL on their academic success was created using the data acquired from table 4.10. The overall index was determined to be 3.94, falling within the positive area according to the established grading process. Consequently, the researcher arrived at the conclusion that learners perceive a relationship between proficiency in KSL and their academic achievements.

The perspectives of educators regarding the impact of literacy in KSL on the academic achievement of learners with hearing impairments were also solicited. Table 4.11 presents a comprehensive overview of the collected responses.

**Table 4. 11: Teachers' perception on the influence of literacy in KSL on academic performance of pupils with HI**

Item	Strongly Agree		Agree		Neither agree nor disagree		Disagree		Strongly Disagree		N	Index
	F	%	F	%	F	%	F	%	F	%		
Able to read all English words in a given sentence/paragraph.	17	18.3%	20	21.5%	15	16.1%	27	29.0%	14	15.1%	93	3.00
Pupils normally read and do comprehension based on KSL	41	44.1%	28	30.1%	6	6.5%	10	10.8%	8	8.6%	93	3.90
Pupils often use KSL in all communications.	28	30.1%	32	34.4%	5	5.4%	15	16.1%	13	14.0%	93	3.51
There are some signs in KSL that pupils have not mastered.	50	53.8%	30	32.3%	9	9.7%	1	1.1%	3	3.2%	93	4.23
<b>Total Influence of Pupils Literacy in KSL on their Academic Performance Teachers Rating</b>											<b>93</b>	<b>3.66</b>

The results showed that among the educators surveyed, 17 (18.3%) strongly agreed that learners can read all English words in a given sentence, 20 (21.5%) agreed, and 15 (16.1%) were unsure. In addition, 27 (29.0%) of the educators disagreed and 14 (15.1%) strongly disagreed with the statement that learners had the ability to read all English words in a given sentence. The majority of learners, according to the teachers, cannot read the English words as written. Learners with HI may be struggling in school because of this. These findings are consistent with those of a study by Friend (2008) that found HI learners have a hard time understanding written examples of Standard English. Marschark et al. (2009) found that learners who do not do well are at a disadvantage because they have less exposure to both formal and informal language.

Furthermore, 8 (8.6%) were strongly disagreeing, 10 (10.8%) were disagreeing, 6 (6.5%) were unsure, 28 (30.1%) agreed, and 41 (44.1%) were very agreeing that KSL is typically used for reading and comprehension. Based on the results of the survey, we also know that 28 teachers (30.1%) agree, 32 teachers (34.4%) agree, and 5 teachers (5.4%) are unsure. According to the research, 13 teachers (14%) strongly disagreed and 15 (16.1%) disagreed that learners routinely employ KSL in all exchanges. Also, approximately 50(53.8%) of the educators concurred that learners have not yet mastered all of the KSL signals. In addition, 7 head teachers surveyed reported having children who could not read basic English sentences.

Based on the sums of the counts in table 4.11, we can calculate the overall index of teachers' ratings of the influence of pupils' literacy in KSL on their Academic Performance. The average rating was 3.66. According to the scoring rubric, this places the result in the

"positive" column. Teachers who are fluent in KSL are likely to believe that the language has an impact on their learners' academic success.

The chi-square test was used by the researcher to see if there is a relationship between KSL literacy and test scores. Table 4.12 displays the outcomes.

**Table 4. 12: Relationship between literacy in KSL and academic performance**

		<b>Below average</b>	<b>Average</b>	<b>Above average</b>	<b>Total</b>	<b>Statistics test</b>
<b>KSL literacy</b>	Disagreed	24(22.2%)	10(9.3%)	12(1.1%)	46(42.6%)	$\chi^2 = .12.422,$ $df = 4,$ $p = 0.014$
	Neutral	16(14.8%)	13(12.0%)	7(6.5%)	36(33.3%)	
	Agreed	10(9.3%)	2(1.9%)	14(13.0%)	26(24.1%)	

The study findings in table 4.11 show that out of 46(42.6%) learners who disagreed on KSL literacy 24(22.2%) scored below average in their previous exams, 10(9.3%) scored average and 12(11.1%) scored above average. Further 36(33.3%) of the learners who were neutral on KSL literacy 16(14.8%) scored below average on their previous exam, 13(12.0%) scored average and 36(33.3%) scored above average. Finally, of the 26(24.1%) of learners who agreed on KSL literacy 10(9.3%) scored below average in their previous exam, 2(1.9%) scored average and 14(13.0%) scored above average.

The results in table 4.12 also indicate p value =0.014 and since in this case  $p=0.014 < \alpha=0.05$ , the researcher rejected the null hypothesis  $H_0$ . This implies that there is significant relationship between the learners' literacy in KSL of learners with HI and their academic performance.

#### 4.5 Challenges faced by Pupils with hearing Impairment in learning of KSL

The study also sought to establish the various challenges faced by pupils with hearing impairment in the process of learning KSL. The responses obtained from the teachers are as discussed herein and shown in table 4.13.

**Table 4. 13: Teachers responses on challenges faced by pupils with HI in learning KSL**

Item	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		N
	Count	%	Count	%	Count	%	Count	%	Count	%	
Difficulty in KSL hinders learning process during instruction.	27	29%	25	26.9%	9	9.7%	19	20.4%	13	14%	93
Inadequate learning materials are an impediment.	29	31.2%	28	30.1%	13	14%	15	16.1%	8	8.6%	93
Societal stereotypes and negative culture makes learning KSL difficult.	24	25.8%	33	35.5%	6	6.5%	19	20.4%	11	11.8%	93

Table 4.13 shows that 27 (29.0%) of teachers strongly agreed that difficulty in KSL affects learning during instruction, 25 (26.9%) agreed, and 9 (9.7%) were undecided. The researcher also discovered that 19(20.4%) of teachers disputed that difficulty in KSL impedes learning during instruction, while 13(14.0%) strongly disagreed. The survey found that heads and teachers agreed that low staffing has an impact on the performance of learners with HI. According to the findings, 29 (31.2%) of teachers strongly agreed that insufficient learning materials are a hindrance to studying KSL, 28 (30.1%) agreed, and 13



(14.0%) were undecided. Furthermore, 15 (16.1%) of the teachers disagreed, with 8 (8.6%) severely disagreeing.

Furthermore, 24 (25.8%) of the teachers believed that societal stereotypes and unfavorable culture make studying KSL harder, 33 (35.5%) agreed, and 6 (6.5%) were undecided. The remaining 19 (20.4%) disagreed, with 11 (11.8%) strongly disagreeing. This statistic demonstrates that societal preconceptions and bad culture are thought to have an impact on KSL learning, consequently affecting academic achievement of learners with HI. The findings are consistent with those of Mwanyuma (2016), who blames low performance at the Sahajanand School for the Deaf in Kilifi County to the general public's stereotypical attitude toward the deaf.

**Table 4. 14: Pupils with HI responses on challenges they face in learning KSL**

Item	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		N
	Count	%	Count	%	Count	%	Count	%	Count	%	
Difficulty in KSL hinders learning process during instruction.	73	67.6%	18	16.7%	4	3.7%	10	9.3%	3	2.8%	108
Inadequate learning materials are an impediment.	68	63.0%	14	13.0%	13	12.0%	8	7.4%	5	4.6%	108
Societal stereotypes and negative culture makes	63	58.3%	15	13.9%	11	10.2%	4	3.7%	15	13.9%	108

learning  
KSL  
difficult.

Table 4.14 shows the responses gathered from learners with HI regarding the challenges they face while learning KSL. According to table 4.14, 73(67.6%) of the learners with HI strongly believe that difficulty in KSL hampers learning during instruction, 18 (16.7%) agreed, and 3(2.8%) strongly disagree. Furthermore, the findings revealed that 68(63.0%) of the learners with HI strongly agreed that insufficient learning materials constitute a hindrance, 14(13.0%) agreed, and 13 (12.0%) were undecided. In addition, 8 (7.4%) disagreed, with 5 (4.6%) severely disagreeing. It was also shown that 63 (58.3%) of learners strongly agreed that societal stereotypes and unfavorable culture make learning KSL difficult, while 15 (13.9%) agreed and 11 (10.2%) were undecided. According to the researcher, 4 (3.7%) of the learners disagreed, while 15 (13.9%) strongly disagreed.

The study further aimed at establishing if there is a significant relationship between challenges faced in the learning of KSL and academic performance of pupils with HI. The results are as summarized in table 4.15.

**Table 4. 15: Relationship between challenges faced in learning of KSL and academic performance of learners with HI**

		<b>Below average</b>	<b>Average</b>	<b>Above average</b>	<b>Total</b>	<b>Statistics test</b>
<b>Challenges faced</b>	Disagreed	12(11.1%)	0(0.0%)	0(0.0%)	12(11.1%)	$\chi^2 = 16.153$ , df= 4, p = 0.003
	Neutral	22(20.4%)	13(12.0%)	20(18.5%)	55(50.9%)	
	Agreed	16(14.8%)	12(11.1%)	13(12.0%)	41(38.0%)	

Table 4.15 shows that out of 12(11.1%) of learners who disagreed on challenges faced 12(11.1%) scored below average in their previous exam. Also, of 55(50.9%) of the learners who were neutral on challenges faced 22(20.4%) scored below average in their previous exam, 13(12.0%) scored average and 20(18.5%) scored above average. Finally of 41(38.0%) of the learners who agreed on challenges faced 16(14.8%) scored below average on their previous exam, 12(11.1%) scored average and 13(12.0%) scored above average.

The findings presented in Table 4.15 reveal a p-value of 0.003. Since 0.003 is less than 0.05, the researcher rejected the null hypothesis H03. This suggests that there is a substantial relationship between the obstacles encountered by learners with HI while acquiring KSL and their scholastic achievements. These findings are comparable to those of research conducted elsewhere. Yara (2010), for instance, concluded in a report on teaching and learning resources and academic achievement in the Bondo district that a significant relationship existed between such resources and mathematics performance. According to Kochung (2003), resources for special HI student schools and units are inadequate.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary, conclusions and recommendations of this study. This is based on the research findings that have been presented and discussed in the previous chapter. Recommendations for further research as well as policy and practice have been made.

#### **5.2 Summary of Findings**

The core objective of this study was to establish the relationship between mastery of KSL and academic performance of learners with hearing impairment. This section gives a summary of the findings based on the objectives of this study.

##### **5.2.1 Influence of interpretation of KSL and academic performance of pupils with HI**

Academic achievement is directly impacted by a student's capacity to decipher English vocabulary in KSL. Fifty percent of the learners surveyed indicated in the study that their academic performance is, in fact, influenced by their capacity to interpret English words in KSL. In a similar vein, 83.7% of the educators expressed agreement with the notion that learners' academic performance is impacted by their ability to execute English in KSL effectively.

Furthermore, a relationship was observed between learners' academic performance and their proficiency in translating English to KSL. Notably, 70.4% of learners and 73.9% of instructors agreed that the academic performance of learners with hearing impairments is impacted by the quality of KSL-to-exact signed English translations. The reason for this is

that learners with HI are instructed in English and KSL; thus, proficient comprehension and translation of these two languages have an immediate impact on academic achievement.

Communicating with learners who have hearing impairments using KSL finger spelling has an impact on their academic performance. According to the findings of the research, 87.7% of the teachers and 70.5% of the learners agreed that the performance of the learners is impacted by the interpretation of the finger-spelled KSL. Possessing the ability to decipher the finger-spelled KSL could potentially improve the academic performance of learners by allowing them to comprehend the given instructions.

Additional findings of the study revealed a relationship between the academic achievement of learners with HI and their capacity to distinguish between finger-spelled and signed words during communication. According to the results, 82.55 percent of the learners agreed or firmly agreed that their academic performance is impacted by their ability to distinguish signed words from signed spelled words in communication.

### **5.2.2 Effects of Pupils Literacy in KSL on their Academic Performance**

The study revealed that a considerable proportion of the learners exhibit an inability to comprehend all English terms inside a given sentence. Based on the findings of the study, it was observed that a mere 39.8% of teachers expressed agreement or strong agreement on the proficiency of children in reading all English words inside a phrase. Conversely, a majority of teachers (45.1%) expressed disagreement or strong disagreement with the notion that pupils possess the ability to read English words within a given sentence. This observation suggests that a significant number of learners exhibit challenges or limitations when it comes to understanding English words within sentences.

The findings of the survey indicate that a significant majority of the learners, specifically 79.6%, expressed agreement or strong agreement regarding the impact of their proficiency in interpreting English terms in KSL on their academic achievements. The relationship between proficiency in KSL and academic performance was observed, with 76.4% of teachers expressing agreement or strong agreement about the impact of learners' mastery of KSL on their academic achievements. A majority of 74.1% of the learners expressed agreement with the adverse impact on their academic performance resulting from their lack of mastery in some KSL words.

Additionally, the results of the research indicated that a significant majority of the learners, specifically 75%, expressed agreement or strong agreement with the impact of their proficiency in KSL on their academic achievements. A significant majority of the learners, specifically 75.0%, expressed agreement or strong agreement with the impact of their proficiency in KSL on their academic success. Similarly, a notable proportion of teachers, specifically 64.5%, also endorsed this assertion.

### **5.2.3 Challenges faced by pupils with hearing impairment in the learning process**

The study additionally aimed to ascertain the diverse obstacles encountered by learners with hearing impairment throughout the acquisition of knowledge in Kenyan Sign Language (KSL). The research conducted has demonstrated that a lack of sufficient expertise among teachers in KSL has a detrimental impact on their learners' learning experience, mostly through impeding effective communication. The aforementioned scenario received the endorsement of 81.5% of the learners. Approximately 55.9% of the surveyed instructors

concurred that the insufficiency of adequately trained KSL (Kenya Sign Language) teachers is a significant difficulty for learners, thereby impacting their academic achievement.

In relation to the accessibility of resources, the research findings indicate that a significant proportion of the learners, specifically 63.0%, expressed a strong consensus that their academic performance is negatively impacted by the insufficiency or limited availability of teaching and learning resources. Additionally, 13.0% of the participants agreed with this sentiment, while 12.0% remained uncertain or undecided. The findings of the study also indicated that a proportion of 7.4% expressed disagreement, whereas 4.6% strongly disagreed. The researcher additionally observed that a significant proportion of teachers, namely 31.2%, expressed a strong agreement with the notion that insufficient and appropriate learning resources have a detrimental impact on learners with Hearing Impairment, resulting in their inability to excel academically. A total of 30.1% of the participants expressed agreement, while 14.0% remained undecided. The study additionally found that a proportion of 16.1% of the teachers expressed disagreement, while a smaller proportion of 8.6% strongly disagreed.

Additionally, the research findings indicated that a significant majority of the learners, specifically 58.3%, expressed a strong agreement about the impact of stereotypes and negative societal attitudes towards children with hearing impairments on their academic achievements. Furthermore, 13.9% of the participants agreed with this notion, while 10.2% remained indecisive. Additionally, it was observed by the researcher that a total of 13.9% of the learners expressed agreement. A significant proportion of instructors, specifically 25.8%, expressed a strong agreement with the impact of stereotypes and unfavorable cultural

influences on the academic achievement of learners with hearing impairments. A total of 35.5% of participants expressed agreement, and 6.5% remained undecided. In contrast, a minority of 20.4% expressed disagreement, while a smaller proportion of 11.8% strongly disagreed.

### **5.3 Conclusion**

Based on the results of the study, the following conclusions were made:

- a) The utilization of Kenya sign language interpretation by learners with hearing impairment has an impact on their academic achievement. This finding is supported by the overall index score of 3.83 obtained from the rating of the Influence of KSL Interpretation on academic achievement by pupils. This score suggests that pupils perceive a significant impact of KSL interpretation on their academic success. Moreover, the comprehensive index of the Impact of KSL Interpretation on instructors' evaluation of academic performance was determined to be 3.92. This finding suggests that educators similarly perceive that the interpretation of KSL has an impact on the academic achievement of learners. Furthermore, the chi-square test yielded a p-value of 0.003, leading to the rejection of the null hypothesis. This suggests a strong association between the interpretation of Kenyan Sign Language (KSL) by learners with hearing impairment (HI) and their academic achievement in primary schools in Kenya.
- b) Pupils Literacy in KSL influenced their Academic Performance. From the results, the overall index for the influence of pupils' literacy in KSL on their academic performance pupils rating was 3.94. According to the scoring procedure, it was



concluded that literacy in KSL influences pupils' with HI academic performance. Further, the overall index of the teachers rating of influence of pupils' literacy in KSL on their Academic Performance was 3.66 meaning that teachers believe literacy of KSL influences academic performance of pupils with hearing impairment. The chi square test also revealed a significant relationship between the learners' with HI literacy in KSL and their academic performance with a p value 0.014.

- c) Pupils with hearing Impairment face challenges in regard to mastery of KSL hence affecting their academic performance. Most of the respondents indicated that there is shortage of trained KSL teachers, there are inadequate teaching and learning resources and there are social stereotypes and negative culture against pupils with hearing impairment. Also, the chi square test revealed a p value of 0.003 hence the researcher concluded there is significant relationship between learners with challenges faced by learners in KSL learning and their academic performance.

#### **5.4 Recommendations**

The study recommends as follows:

- a) The government is advised to establish a comprehensive training for the teachers of the learners with HI in order to increase their numbers. In-service training should also be encouraged so as to help normal teachers employed in special schools for learners with HI or units to teach well and professionally.
- b) The government together with school administrations should enhance awareness campaigns for the purpose of changing the social stereotypes and negative culture of the hearing community on matters of Deaf Education in general. This could include having awareness seminars or public speeches.

- c) The government should consider supporting teachers to enable them advance their education and acquire additional skills on KSL as a long-term strategy in improving academic performance among learners with HI.

### **5.5 Recommendations for further research**

It is recommended that further research be conducted basing on other factors that contribute to the academic performance of HI learners in public primary schools such as personal characteristics of teachers, counsellors, financial support by government or school administration, among other factors.

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## **APPENDICES**

### **Appendix A: Respondents Informed Consent**

Dear Respondent,

**Re: Relationship between Mastery of Kenya Sign Language and Academic Performance of Pupils with Hearing Impairment in Selected Primary Schools in Kenya**

My Name is Tom Wawire a student of Masinde University of Science and Technology, undertaking a Master's Degree of Arts in Curriculum and Instructional Studies. As part of my Master Degree project, I am conducting research on the aforementioned topic and would really value your thoughts and input. All data collected will be kept in strict confidence and used solely for scientific research.

It is my sincere hope that you would be able to provide me with the necessary data for my study. All information regarding your identify will be kept strictly confidential. Such data will be kept confidential and used for the sole purpose of this research.

Your assistance and cooperation will be greatly appreciated. Please confirm that you are in agreement with the researcher to provide the needed information willingly by signing below. Thank you.

Yours respondent,

.....

## APPENDIX B: PUPILS' QUESTIONNAIRE

I am doing research on Relationship between Mastery of Kenya Sign Language and Academic Performance of Pupils with Hearing Impairment in Selected Primary Schools in Kenya. Your contributions will be highly appreciated.

(Please respond by ticking appropriately)

### Section A

What is your age bracket?

Below 12 years (        )

13 – 15 years (        )

16 – 18 years (        )

19 years and above (        )

What is your gender?

a. Male (        )

b. Female (        )

3 Are you aware of the use of sign language among learners in secondary schools?

Yes [    ]

No [    ]

### Section B

(Scale 5, 4, 3, 2, 1) Highest to lowest

Key: SA (Strongly agree) =5

A (Agree) =4

U (Undecided) =3

D (Disagree) =2

S D (Strongly Disagree) =1

**4 Effects of pupils' interpretation of Kenya sign language on academic performance of pupils with hearing impairment.**

<b>Response</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
You are able to interpret English words in Kenya Sign Language.					
You can translate KSL to signed exact English.					
You can interpret finger-spelled words quickly during instruction.					
You are able to differentiate signed words from finger-spelled words in sentence construction.					

**5 Challenges faced by pupils with hearing impairment in their use of KSL**

<b>Response</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Difficulty in KSL hinders learning process during instruction.					
Inadequate teaching and learning resources hinder learning among pupils with hearing impairment.					
Stereotypes and negative culture in society over children with hearing impairment makes it difficult to learn KSL among pupils in public primary schools.					

**6 To establish the influence of pupils literacy in KSL on academic performance of pupils with hearing impairment**

<b>Response</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
You have the ability to read all English words in a given paragraph or sentence.					
You normally read and do comprehension based on KSL.					
There are some signs in sign language that I have not mastered.					
You often use KSL in all your communications.					



## APPENDIX C: TEACHERS' QUESTIONNAIRE

I am doing research on Relationship between Mastery of Kenya Sign Language and Academic Performance of Pupils with Hearing Impairment in Public Primary Schools in Kenya. Your contributions will be highly appreciated.

(Please respond by ticking appropriately)

### SECTION A

What is your age bracket?

20 – 30 years (      )

30 – 40 years (      )

40 – 50 years (      )

50 years and above (      )

What is your gender

Male (      )

Female (      )

Are you aware of the use of sign language among learners in primary schools?

Yes (      )

No (      )

### SECTION B

(Scale 5, 4, 3, 2, 1) Highest to lowest

Key: SA (Strongly agree) = 5

A (Agree) =4

U (Undecided) =3

D (Disagree) =2

SD (Strongly Disagree) =1

Effects of pupil's interpretation of Sign Language on academic Performance of pupils with hearing impairment.

<b>Response</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Pupils are able to interpret English words in Kenya Sign Language.					
Pupils can translate Kenya Sign Language to signed exact English.					
Pupils can interpret finger-spelled words quickly during instructions.					
Pupils are able to differentiate signed words from finger-spelled words in sentence construction.					

Challenges faced by pupils with hearing impairment in learning process of Kenya Sign Language

<b>Response</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Difficulty in KSL hinders learning process during instruction.					
Inadequate learning materials are an impediment to learners with hearing impairment in primary schools.					
Societal stereotypes and negative culture makes it difficult for pupils learn Kenya Sign Language in primary school.					

To establish the impact of pupils' literacy in Kenya Sign Language on academic performance of pupils with hearing impairment.

<b>Response</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Pupils have the ability to read all English words in a given paragraph or sentence.					
There are some signs in sign language that pupils have not mastered.					
Pupils normally read and do comprehensions based on sign language.					
Pupils often use KSL in all their communications.					

## **APPENDIX D: HEAD TEACHERS' INTERVIEW SCHEDULE**

1. For how long have you been in this school?
2. What are your teaching subjects?
3. What was the school mean score in:
  - a. 2015
  - b. 2014
  - c. 2013
4. (a) How many teachers of HI do you have in the school?  
(b) Comment on their adequacy.
5. Comment on the ability of pupils with HI to interpret English words in Kenya Sign Language.
6. Can pupils translate Kenya Sign Language to signed exact English?
7. Can pupils with HI interpret finger-spelled words quickly during instruction?
8. Comment on the ability of pupils with HI to differentiating signed words from finger-spelled words in sentence construction.
9. Mention something on availability of properly trained teachers to enable learners to grasp the knowledge fast enough
10. Are inadequate resources and learning materials an impediment to learners with hearing impairment in primary schools? Expound.
11. How do societal stereotypes and culture makes it difficult to teach and learn Kenya Sign Language among learners in primary school
12. Do pupils have the ability to read all English words in a given paragraph or sentence?
13. Do pupils normally read and do comprehension based on sign language?
14. How do pupils use signs from in all your communications?
15. Do your teachers have formal professional training in KSL? Expain.
16. Is there is infusion of KSL and signs from the catchment area in the teaching and learning process?
17. Do your teachers have the ability to interpret KSL to signed exact English during instruction

## APPENDIX E: STUDY PLAN

Stage	Research activity	Period	Output
1	Pilot survey	December 2015	
	Collection and computation of literature. Writing and computing proposal Production of research tools	January – April 2016	Proposal Sampling Research Sample
2	Proposal presentation	June 2016	Research permission
3	Main research work Seeking research permit Pilot study Pre-test of research tools Collection of data from respondents	December 2018	Research Data
4	Data processing and analysis Editing and data analysis Consultation with supervisors	August & September 2016	Preliminary Results
	Preparation of research report and dissemination		
5	Part 1 Editing of draft thesis Submission of first draft Correction of first draft	October – November 2016	First draft
	Part 2 Submission of the 2 <sup>nd</sup> draft	December 2016	Second draft
	Part 3	February 2017	Final thesis

## APPENDIX F: BUDGET



### NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,  
2241349,3310571,2219420  
Fax: +254-20-318245,318249  
Email: dg@nacosti.go.ke  
Website : www.nacosti.go.ke  
When replying please quote

NACOSTI, Upper Kabete  
Off Waiyaki Way  
P.O. Box 30623-00100  
NAIROBI-KENYA

Ref. No: **NACOSTI/P/18/29925/26105**

Date: **29<sup>th</sup> October, 2018**

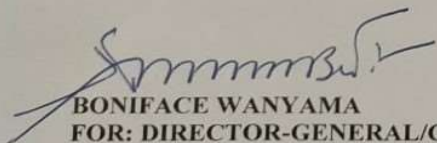
Tom Mdjembi Wawire  
Masinde Muliro University of Science and Technology  
P. O Box 190-50100  
**KAKAMEGA**

#### **RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on *“Relationship between mastery of Kenyan sign language and academic performance of pupils with hearing impairment in selected Public Primary Schools in Kenya”* I am pleased to inform you that you have been authorized to undertake research in **selected Counties** for the period ending **29<sup>th</sup> October, 2019**.

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.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

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

Copy to:


The County Commissioners  
Selected Counties.

The County Directors of Education  
Selected Counties.

**APPENDIX G: RESEARCH PERMIT**

THIS IS TO CERTIFY THAT:  
**MR. TOM MDJEMBI WAWIRE**  
of **MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY, 160-50205  
WEBUYE, has been permitted to conduct  
research in Bungoma , Busia  
Kakamega , Vihiga Counties**  
on the topic: **RELATIONSHIP BETWEEN  
MASTERY OF KENYAN SIGN LANGUAGE  
AND ACADEMIC PERFORMANCE OF  
PUPILS WITH HEARING IMPAIRMENT IN  
SELECTED PUBLIC PRIMARY SCHOOLS IN  
KENYA**  
for the period ending:  
**29th October, 2019**

**Permit No : NACOSTI/P/18/29925/26105**  
**Date Of Issue : 29th October, 2018**  
**Fee Received :Ksh 1000**



**Applicant's Signature** **Director General**  
**National Commission for Science,  
Technology & Innovation**

**APPENDIX H: MAP OF KENYA INDICATING THE LOCATION OF WESTERN KENYA**

