Master's Dissertation

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Title

Late acquisition of South African Sign Language of Deaf Children from Hearing Parents: A Sociolinguistic Perspective

Declaration

I, Annemarie le Roux, declare that this dissertation is my own original work undertaken in fulfilment of my Master's degree in the Faculty of Humanities, Department of South African Sign Language and Deaf Studies, at the University of the Free State is my independent work, and that I have not previously submitted it for a qualification at another institution of higher education.

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Abstract

Language development in deaf children is often hampered by the fact that 90 percent of these children are born into hearing families, and due to the fact that most hearing parents do not know Sign Language (SL) (Lane, Bejan, & Hoffmeister, 1996). The deaf child might be the family's first contact with deaf people. Communication with the deaf child is only one aspect that parents need to consider, as this child will not have the same typically accessible linguistic inputs as their hearing peers. Parents will most often only use spoken language to communicate with the child. Therefore, there is no or very little language exposure (Lindfors, 1991). Many deaf children only start to learn a language, most likely a signed language or a written language, when they start attending school between the ages of three and seven. This could occur even later, depending on when the hearing loss is discovered. As a result, many deaf children have a backlog in cognitive and language development and often finds it hard to acquire a SL e.g. South African Sign Language (SASL) as well as the written form of a spoken language (e.g. English).

Therefore, research has been done to determine the impact of late exposure of SL to deaf children's language learning and development with regard to signed and written language. The assumption (hypothesis) made in this study is that it is not too late for a deaf child from hearing parents to develop basic cognitive and language skills that are on the same level than his or her hearing peers, providing that the child is exposed to language at an early age.

The researcher observed and tested seven deaf children, between the ages of four and seven, at a special school for the Deaf in a rural area of South Africa. A mixed method research was used to obtain the data. Deaf learners in Grade R were observed in a classroom setting, which provided a sociolinguistic perspective to the study. Specialised tests were conducted to determine their use and understanding of SASL. The level of understanding of SASL was assessed through their interaction with signed stories. Learners were exposed to understanding language (SASL) through the identification of specific signs, for example, the researcher signed DOG and the child had to identify the card with the picture of the dog, on it. The data was gathered from March to September 2016, a period of seven months, where learners participated in seven activities.

In the beginning of the study, the learners were very unsure when communicating as they only had some "home signs" which the family had "developed" in order to communicate at home. As the year progressed and they learned how to communicate using correct SASL signs and structure, they become more confident in everyday communication.

The study concluded that the impact of late exposure to SL on deaf learners' language learning and development, proved to be a serious problem. This is due to a lack of exposure to a language that they are able to understand. The level of language development cannot be compared favourably with the level of language development of children who had exposure to early language development. If early language intervention takes place, it would have had a positive influence on their understanding and use of SL when they entered school.

Within this dissertation, the researcher will share more detailed findings regarding late language acquisition of young deaf children growing up in hearing families. The hypothesis will be discussed and whether the validity thereof can be accepted or rejected.

Keywords: Bilingual-Bicultural; Cognitive Development; Deaf; Deaf Culture; Deaf Education; Early Language Intervention; Hard of Hearing; Language Acquisition; Language Development; South African Sign language.

Words: 592

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Abbreviations

BiBi	Bilingual Bicultural
LOLT	Language of learning and teaching
L1	First Language
L2	Second Language
NID	National Institute of the Deaf
OT	Occupational therapist
SASL	South African Sign Language
SL	Sign Language
SOV	Subject, Object, verb
SVO	Subject, Verb, Object

Chapter 1: Introduction

1.1 Background

The aim of this study is to investigate the impact of underdeveloped language skills on the early cognitive and language learning of deaf children. The study wants to establish whether it is too late for a deaf child with a backlog in cognitive development to develop basic cognitive and language skills.

A situation where the parents are hearing and the child is deaf, is normally a traumatic experience as the parents do not know what to expect or could blame themselves because the baby is deaf. The parents do not have information on how to react to this situation or what options there are for language acquisition and school placement. This is because there is limited assistance available from clinics and social workers. They have limited knowledge about deafness and therefor do not know how to guide the parents. The family must adapt to the new situation that encompasses deafness with limited knowledge and access to resources. As a result, the likelihoods that the family will learn sign language (SL) are limited. This means that the child will not have typical accessible linguistic inputs, as they are not able to hear their parents' voices. Therefore, there is no or very little language exposure.

One of the problems that was identified in this study is that many deaf children only start to learn a language when they start attending school between the ages of three and seven and sometimes later, depending on when the hearing loss is discovered. As a result of this, the deaf child has a backlog in cognitive and language development and often finds it hard to learn a SL e.g. South African Sign Language (SASL) as well as the written form of a spoken language e.g. English.

A Deaf[1] child that grows up with family and friends that can sign, is exposed to a rich SL environment where the acquisition of the reading and written language, e.g. English, will take place more naturally. The acquisition of language will take place the same way that hearing children will acquire language. The first language (L1) helps with the development of a second language (L2). However, it would be unnatural if there were no L1 to help with the development of the L2 (Ramírez, Lieberman, & Mayberry, 2013). Even if SL is not a deaf learner's L1, typical L2 acquisition will still take place. When the L2 as

[1] In this study, the researcher will use the upper case 'D' to refer to the socio-cultural concept of deafness as a linguistic group, or community with a distinctive culture. When referring to Deaf children of Deaf parents, the upper case 'D' will be use but when referring to 'deaf' in general the lower case "d" will be used. For clarity, the researcher will use the lower case 'd' either as an adjective e.g. the deaf girl; deaf people; etc. or when referring to the audiological condition, and in the case of deaf children of hearing parents (in accordance with convention in the field of Deaf Studies).

a reading and written language develops to a functional level, it will be similar to L1 acquisition (Madriñan, 2014).

Language and cognitive development in young deaf children are not only important in the South African context, but also globally. This affects the entire Deaf population, including parents, teachers of the Deaf and even Departments of Education. Problems associated with cognitive development regularly occur if young deaf children are not introduced to language at the earliest possible age. This goes hand-in-hand with the age that the hearing loss is discovered. There is very little research done regarding young deaf children and the effect their language development has on their cognitive and educational development in South Africa. Therefore, a study like this will be valuable in SASL research.

This study was done at the Bartimea School for the Deaf and Blind, which is in a rural area in the Free State. The learners come from all over South Africa as well as Lesotho, as the school offers boarding facilities. The school caters for both blind and deaf learners and they are taught in separate streams. The researcher worked with the Grade R class. The ages of the learners in this class ranged from four to seven. The learners did not have any hearing aids, which could have had an influence on their language development. The learners were all deaf or extremely hard of hearing and that meant that they all experienced the same level of exposure to any kind of sounds or words. All the learners in this study came from hearing families that knew either very little SASL or none at all. The families usually communicated with the learners by speaking or using gestures, because family members were not educated in SASL or did not make the effort to learn SASL. For many of the learners, arrival at the school was their first contact with any language. As a result of this, the learners had a backlog in language development, which could be the reason for potential future academic problems in school.

1.2 Purpose of the Study

The assumption (hypothesis) made in this study is that it is not too late for a deaf child from hearing parents to develop basic cognitive and language skills on the same level as his or her hearing peers, providing that the child is exposed to language at the earliest possible age.

1.3 Limitations

Several limitations were experienced during the collection of data. The first limitation was that the researcher did not have any background on the deaf children's parents or their family environment. According to the learners' teachers, there were no or very few books available at their homes to promote

language development. Written language was seldom used at home and that had an impact on their language development.

The second limitation was that there is no standardised test for deaf learners' cognitive or language development and therefore, the original test by Woodcock-Johnson III Tests of Achievement (WJ III ACH) (Wendling, Schrank, & Schmitt, 2007), that was designed to include written and oral skills, was adapted by the researcher to use drawings and signing to suit the deaf children. Refer to Addendum 4A for the test and adaptations.

A third limitation was the fact that the children's attention span was very short, therefor; time spent with the learners was restricted to 30 minutes per session. Furthermore, the sessions took place during school hours and the researcher had to adhere to the school's schedule.

The fourth limitation involved financial implications. The researcher had to travel 120km once a week over a period of seven months from March to September 2016. Therefore, the study was restricted to one school, one province and a limited number of available respondents from one ethnic group.

The fifth limitation is the lack of the use of more recent sources and this explains the older sources used in this research. The researchers is not aware of any similar studies done on this topic in South Africa.

1.4 Chapter Layout

This dissertation is organised in the following manner: Chapter 1 gives an overview of the study. Chapter 2 comprises of the literature review. The linguistics of SL is discussed to show that it is equal to any other spoken language as well as the importance of language development. In Section 2.2, definitions of SL are given and one definition that will be used for this study is pointed out. Section 2.3 deals with linguistics specific to SL that looks at the phonology, morphology and syntax. A discussion on the parameters of SL is also included. Section 2.4 gives an overview on language development in general and the stages and milestones in language development from birth to six years of age are discussed. These stages and milestones are summarised in Table 2.2. In Section 2.5, the researcher looks at the critical periods in language development and include hearing and deaf children respectively. Cognitive development of young children in general is discussed in Section 2.6. The following stages are briefly discussed: sensorimotor stage (zero to two years), pre-operational stage (two to seven years), concrete operational stage (seven to eleven years) and formal operational stage

(11- adult). In Section 2.7, the researcher looks at how the environment plays a role in language development and focusses specifically on hearing parents with deaf children; Deaf parents with Deaf children; and Deaf parents with hearing children. The different family scenarios are discussed in short and the one that falls into this study – a deaf child in a hearing family - is discussed in more detail. The researcher considers the role SL plays in Deaf Culture in Section 2.8 and why Deaf Culture is important for the deaf child, especially in a hearing family. Deaf Education is discussed in Section 2.9. In Section 2.9.1 the reasons are set out why it is important for a child to be identified as deaf as early as possible and how this has an influence on the education of a deaf child. The current situation of Deaf education in South Africa is discussed in Section 2.9.2 while the concept of Bilingual-Bicultural (BiBi) is discussed in Section 2.9.3.

Chapter 3 provides an overview on the participants, the research methods that were used and how data was gathered and analysed. In Section 3.2, a background of the seven participants is given and in Section 3.3, the class that was used in the study is described. Grade R boys and girls between the ages of four and seven at the above-mentioned school were observed. The researcher interacted with the learners and did not observe classes and teachers. Section 3.4 deals with the necessary content and permission from the Department of Education, the school, teachers and parents that was obtained. The learners and teachers' identities will be kept anonymous in order to protect them and also to preserve the objectivity of the research. Parents and teachers both signed a consent form giving permission for the recordings to be used and permitting the researcher to publish the findings using the data. In Section 3.5 and Section 3.6, the data collection process is discussed and in Table 3.1, an overview of the activities that were used in the study is provided. Video recordings were made by the researcher during lessons to assist with the observations. This indicated learners' understanding of SASL and comprehension of the content. At the start, learners were evaluated by the researcher using flash cards with and without words with pictures, drawings by the learners and signed videos to determine their language and cognitive levels.

The research design and methodology in this study can be described as follows: The study comprised of mixed method (qualitative and quantitate) research and observations and case studies were used to collect the data. The subjects' writing was not tested, but rather their understanding and use of SASL. The evaluation provided the researcher with the data needed and helped to differentiate between the levels of cognitive development in learners with a backlog. The set standards for hearing learners were used regarding language development and the amount of words they had to speak. Section 3.7 deals with the data analysis process.

In Chapter 4, the results of this study are discussed in-depth. The learners were exposed to different activities and these activities show the development in cognitive and language skills. In Section 4.2, the analysis of the data, as well as the aims and facts will be discussed in detail. The seven activities are discussed in Section 4.3 as well as the results and analysis of the data collected in each of the different activities. The results discussion takes place in Section 4.4, where each of the seven learners' performance in the various activities are evaluated and discussed in detail. A conclusion on the findings from the analysis done earlier in the chapter is indicated in Section 4.5.

In Chapter 5, the results are concluded. In Section 5.2, the hypothesis is discussed and whether it should be accepted or rejected. In Section 5.3, the conclusions are given and in Section 5.4, recommendations to the necessary stakeholders are made.

The value of this research is that it suggests ways and provides guidelines in which language barriers can be addressed to assist with including deaf learner's in general educational programmes. The research will furthermore create awareness amongst educators and enable them to identify similar problems and find new answers and solutions to existing problems. It will also enable the Departments of Education and Social Development to provide the necessary/valuable information to future parents of deaf children.

Chapter 2: Literature Review

2.1 Introduction

In this chapter, language and cognitive development will be discussed to provide an understanding of similarities and differences between hearing children and their deaf counterparts. The influence of the environment on the language development in hearing families' *vs* deaf families will be explored. When a child is born deaf in a hearing family, early intervention is of the utmost importance. School placement options for the deaf child has an influence on language acquisition and will therefore be discussed. This chapter will also provide the context as to what a SL is - the natural language of a deaf child - and why it is seen as an equivalent to any spoken language. To understand language development, one needs to understand what SL is.

2.2. Sign Language

2.2.1 Defining SL

SL is a language used mainly by deaf people, but also by hearing people. Fromkin, Rodman and Hyams (2014) state that SL is a visual-gesture system with its own rules and regulations. SL is independent from any spoken language and has its own structure. According to the World Health Organization (n.d), "Around 466 million people worldwide have disabling hearing loss and 34 million of these are children". Each country has at least one and sometimes more than one SL and although they are different, similar structures are visible (Al-Fityani & Padden, 2006). According to Lucas, Bayley, Reed and Wulf (2001), African American signing is different from Caucasian signing, and it is mention that the African American signers use a two-handed, older variation than Caucasian signers of the same ages.

SL does not have a written equivalent because it is a visual language. Deaf people focus on the visual and not on the auditory component when they communicate. SL makes use of handforms and movement, but parts include movement of the body and facial expression, which play an important part in the grammar of the language. SL is not a simple gesture code that represents the spoken language around it and, although it is not a universal language, there are universal similarities in SL. For example, the sign for *America* and *Europe* will be the same in American SL and SASL. An International SL exists as a communication bridge between Deaf people from different countries (Hajung, 2013).

2.2.2 Definitions of SL

Although there are many definitions of SL, the researcher will only look at three. The first definition by Cobuild (2015) states that SL can be seen as movement of the arms and hands to communicate. The second definition by the National Institute for the Deaf (NID) (n.d), says that SL is a natural language that is used by people who have difficulties in communicating using speech. The third definition, and the one that is most relevant to this study because of its focus on SL as a means of communication, is the one by The British Deaf Association (n.d):

> "A Sign Language is a visual language that uses a system of manual, facial and body movements as the means of communication" (n.d).

To be able to understand SL better, it is essential to look at SL linguistics, as discussed in the next section.

2.3 The Linguistics of SL

SL is often dismissed as not being a real language. It is often regarded as a gesture system. Research over the past 30 years as well as that done by Brentari (2011) and Eccarius (2010) has shown that SL is a language just like any other language e.g. English. Although SL does not have a written form, it has a grammar just like any spoken language. However, the rules of the grammar may not all be the same and some are more flexible than others are. According to Kuhn (n.d.), SL is not just mime. She said that there are many different types of SL. It does not depend on a spoken language like English but is unique. Sandler and Lillo-Martins (2009) said that SL could be used for everything that spoken language could be used for e.g. story-telling, poetry, dreaming, for social interaction and education.

Similar to a spoken language, the linguistics of a SL includes a study of language forms (grammar, syntax and phonetics), meaning and language in context. Language forms include language production (written and spoken) and in SL, it means the production of a sign. This implies the use of hands (e.g. which hand the signer will use, whether the signer is left or right handed) and the use of parameters (see Table 2.1). All of these make up the sign, but also the grammar of the sign. Without the correct facial expression or the right movement, the meaning of the sign, as intended, is lost.

In spoken language, phonology is the study of sound. In SL the parts that make up a sign are called the parameters. According to Kuhn (n.d.), there are five parameters in SL namely: handform,

movement, location, palm orientation and facial expression. The parameters are essential when producing a sign. The parameters are an important part of SL. To understand and make sure that language develops learners need to understand and use parameters in such a way that it can benefit their language development.

Table 2.1: The Parameters and Examples of Signs

	Example	**Photo**
Handform: The shape of your hand to make a sign with	A-or B- handforms	 A-handform OR  B-handform
Movement: This is the moving of the handforms when you produce a sign. Not all signs have movement	Book or school	

		 BOOK OR  SCHOOL
Palm orientation: This is the orientation of your palm when you produce the sign. The palm can be facing up, down, left, right, away from the signer/towards the signer.	School and child	 SCHOOL

		OR  CHILD
Location: This is the place where the sign is produced.	Shoulder, head	 HAPPY Sign on shoulder OR  REMEMBER Sign on side of the head

Non-manual markers: These are the various facial expressions or movements of the body to give meaning to the sign. They indicate questions and make a sign more intense.	Smile; sad	 HAPPY Sign with a smile OR  SAD Sad face with sign

SL has one-handed signs, two-handed signs and two-handed signs where only one handed moves.

E.g. YES - one-handed sign

SCHOOL – two-handed sign - both hands moving

MOTHER – one-handed sign

COFFEE – two-handed sign but only one hand moves

Sigs are not produced randomly in the air, it is produced in a specific are that is called the signing space.


Signing space.

These parameters in SL are put together to form a sign just as sounds are placed together in spoken language to form a word. Even if one parameter changes, the meaning of the sign changes e.g. SIT and CHAIR. Movement changes the meaning.

Morphology is the study of the formation and inflection of words. Inflectional morphemes like plurals in SL are produced by repeating the sign e.g. the plural of child (children) will be CHILD-CHILD (Sandler & Lillo-Martin, 2009). Diminutives in SASL are indicated by classifiers and do not have distinctive, separate signs. Tense is indicated by a sign, which indicates the present, past and future tense. Derivational morphemes in a word with different word class forms, for example *organise/organisation,*

might have two different signs, while others like EAT/FOOD have the same sign, but is repeated for the verb EAT.

Syntax refers to word order and depends on parts of speech (Syntax, n.d). The structure of SASL requires that tense is indicate in the beginning of the sentence and a verb and question at the end of the sentence but it can vary depending on the emphasis. As there is no written form for SL, gloss[2] is used if something has to be written in SL structure. Pronouns in SL are indicated by pointing to the third person - male or female - and pointing will be to the side, but if the sign for the second person, singular is made, pointing will be to the front. Both of these are done by the index-handform. Prepositions are indicated with a classifier e.g. *put the cup on the table*: give the sign for *CUP*, then *TABLE* and show with mime and classifiers how the cup is put on the table.

When you are signing a longer sentence or telling something to someone, the signer will first set up the scenario and context and there will be more pointing, use of classifiers and mime to make it understandable.

Conjunctions are signed separately – using a sign like *WHY* or *BECAUSE*, for example: *I need to go home. Why? My mother is sick.* Interjections are signed with a specific facial expression and a sign, for example, *Oh, I see* or *Ok*. The time in a sentence has a specific sign that is always used at the beginning of the sentence. The main reason for this is to give the tense of the sentence. E.g. M*ONDAY I HOME GO* (I am going home on Monday). In SL *wh*-questions for example *who, what, why, when, where* and *how* will always be at the end of the sentence unless it is topicalise. An example of this is *wh*-questions with a facial expression to distinguish between a statement and *wh*-question. Facial expression also plays an important role in yes-no questions.

The structure of a sentence in English is SVO (subject, verb and object) but in SASL, it is SOV (subject, object, and verb). Verbs in SL will always come at the end of a sentence unless it is topicalised. Adjectives can be indicated by a sign after the noun or they can be incorporated into the noun with a facial expression e.g. HOUSE-BIG (it is shown by facial expression - puff cheeks). Adverbs will mostly be incorporated with the verb and the use of classifiers[3] e.g. WALK-FAST (classifier for a person and that person is walking fast).

[2] Gloss: when someone is signing, it is written down or typed out sign for sign (Lifeprint , 2018).
[3] Classifiers: the handshapes that are typically used to show different classes of things, shapes, and sizes. (Lifeprint , 2018).

The knowledge and skills of linguistics play an important role in language development. A linguistic background can make it easier to learn a language.

2.4 Language Development

The introduction of language to children in general is through discourse with their parents. This discourse is setting the stage for the child to acquire and express language orally and to develop their vocabulary. It was noted by Hart and Risley (2003) that between 86% and 98% of vocabulary used by children is similar to those of the parents. Oral vocabulary increases the most between birth and five years (Farkas & Beron, 2004). Language is inextricably entwined with our mental life - our perceiving, our remembering, our attending, our comprehending, and our thinking – in short, all of our attempts to make sense of our experience in the world. According to Yilmas and Aslan (2015), the essential factor in language development is parental guidance when a child acquires language and cognitive skills. This shows why it is so important for parents to be involved at this young age and to be nearby because that is when the young child's vocabulary develops. Children need to discover the world around them and solve problems they are experiencing.

According to Kuhl (2004), it is important for children to be exposed to language for the purpose of learning and production of that language. The average hearing or deaf child is born with language that is present but needs to be developed by people around them from the day of birth. The developmental process is a creative process that needs a language-rich environment, meaningful interactions with people around them and a variety of resources. Initial language learning takes place within the family. In a hearing family with hearing children or a Deaf family with Deaf children, the process of language learning is not a formal or intentional process. Language acquisition is part of the overall development of a child (Clark, n.d). Usually one member of a family and the child share the same language and mode of communication. However, because 90% of deaf children are born in hearing families (Singleton & Matthew, 2000), a situation is created where the parents and child do not share the same mode of communication. Parents use spoken language while the child might not be able to acquire speech, due to the onset of hearing loss and the type of hearing loss. The following question thus arises: what happens to language development of the deaf child in a hearing family? One of the main concerns is that if deaf children do not fully acquire their first (natural) language, which is SL, they may experience difficulties at school. They might struggle to become fully literate and academically proficient for example, in their reading and writing of a spoken language, such as English (Collar & Thomas, 1995).

It is often said that SL is not equivalent to spoken language. However, the following statement from Woolfe, Herman, Roy and Woll (2010) contradicts it:

> "Sign language has the same capabilities as any human language and is acquired naturally by children in deaf families where sign language is used. Research on sign language acquisition among native signers has drawn parallels with hearing children exposed to a spoken language in terms of ages and stages of development" (p. 322).

It is possible to learn how to use SL to communicate just as it is possible to learn a spoken language to communicate. According to research by Cormier, Schembri, Vinson and Orfanidou (2012), acquisition takes place in a similar way. A hearing mother speaking to a hearing baby using many sounds by telling stories and babbling through close face-to-face contact. A Deaf mother with a Deaf baby will also have a lot of face-to-face interaction, but the sounds will be limited, and the mother will use the babies' hands to make "sounds". These will be exaggerated with facial expressions. Similar to the way hearing parents decide that the babbling of *dadada* means daddy, Deaf parents of Deaf babies use finger babbling as signs. Babbling is an important step in brain development and language development, whether that language is spoken or signed. This means that both hearing and deaf babies babble, the first stage of language acquisition, although hearing babies use their voices and deaf babies their hands (Chandler, 2013).

Language learning usually takes place in stages, which will be discussed with milestones in a child's development (see Table 2.2). According to DeWolf, Smit and Wander (2017), the developmental stages are the growth and changes that happened over time in children's mental and physical processes as they develop from birth to adulthood. A milestone is the ability that involves expression of emotions, recognising familiar sounds and talking which is achieved by most children by a certain age.

2.4.1 Stages and Milestones in Language Development

The National Institute on Deafness and Other Communication Disorders (n.d.) gives guidelines that can help parents and teachers to determine whether their child's speech and language skills are developing on schedule.

According to the website, Success for kids with hearing loss (n.d.), and Edublox online tutor (n.d), there is a difference between the milestones in language development of hearing and deaf babies as SL is a

visual language using hands, body and facial expression. In order for a child to acquire SL, he must learn how to use the parameters. The parameters are discussed in Section 2.3.1 and Table 2.1. Although not all children develop at the same pace, general milestones are used as a guideline. This guideline is used in the medical field to determine if the child's development is at the appropriate level for his age. If this not the case, professionals like doctors, occupational therapists, physiotherapists, psychologists and speech therapists can, with the involvement of the parents, investigate why the development is not on par. Alternative problems such as speech impairment, hearing impairment or a more serious problem, like a different disability, could be identified and addressed.

Research done by the California School for the Deaf (n.d) on language development in deaf babies' shows development when they enter early-intervention programmes until they go to kindergarten. The stages of SL development can be seen in Addendum 2A. In order to compare language acquisition between a hearing and a deaf child, it is important to identify and discuss the different stages and milestones of language development. Six stages of language development have been identified and are discussed in Table 2.2 (Language Development and Language Learning, n.d). The discussion in Table 2.2 clearly shows that hearing and deaf children's language development takes place in the same way but with different inputs because deaf children use visuals to learn and hearing children use sound.

Table 2.2 Stages and Milestones in Language Development (according to Edublox online tutor (n.d) and Success for kids with hearing loss (n.d.)).

	The stages	Milestones in general	Milestones in Deaf babies/children	Vocabulary	Child and adult signs
0-5 months	Stage 1: The pre-linguistic stage: The first year is a pre-speech stage of the child's life. This stage includes babbling and crying. The baby starts to make gestures, eye contact and pre-speech sounds like *dadada* and *mamamama.*	Language learning starts from birth. The child is aware, reacts to sound around him[4] and turns his head towards the sound. He smiles when he hears familiar voices. He watches people's faces when spoken to him; he makes noises, for example giggles and cries when talked too. He talks back with noises he makes.	He starts reacting to movement around him and reacts when people around him talk to him, not because he can hear but he sees movement and other people's reactions to the lips moving. He notices signing around him and starts babbling with his hands and mouth. Babbling (Mabbling) is not yet rule-governed.	He makes "coos: and "goos" sounds. Hearing babies react and turn their heads when they hear sounds.	Hearing and deaf babies are on the same stages of language development and will make the same sounds. Adults do not make these sounds.
6-11 months		The child starts to understand things like *no-no,* and he tries to	Hand movements accompany mabbling with the sounds he is	He manually babbles with hands. He reacts	

[4] He, him and his in this research will not refer to the gender but a neutral term that will refer to all genders.

		repeat sounds people make around him. He starts to babble and to communicate with gestures. He will start to respond to change in tone of voices and to sounds like toys making noises, toasters, bird singing and other new sounds. He stops and listens when spoken too. He starts discovering fun games like *where are you a*nd *around and around the garden*. They recognise names of familiar objects like car, eye and phone. Respond to questions and requests.	making. If the parents are deaf, he tries to copy what the parents are signing. He starts making recognisable signs from about 10 -12 months and imitates facial expressions from people talking to him. He starts using basic hand forms and movement imitating his parents' signs. He starts to make complete signs by repeating a sign e.g. MILK will be a hand open and closing. He starts to point to people, objects and places, but not to himself. Parts of the mabbling with hands moving can form part of meaningful conversation and show that the baby is	to sound/signs when parents make the signs or say the words. e.g. MILK BABY	**Baby signs** MILK  BABY 

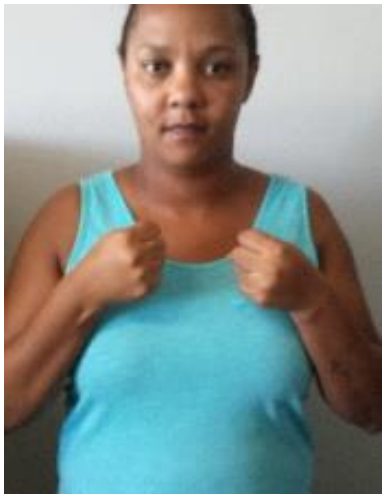
			on his way to developing his natural language. First signs will happen even if the handform is not 100% correct. He uses single signs. He starts to point to people, objects and places, but not to himself.		**<u>Adult signs</u>** MILK  BABY 
12-17 months	<u>Stage 2: The one-word sentence stage:</u> This stage occurs normally between the ages of 10 to 13 months. In this stage the child utters one-	The child starts to focus on books and toys for about two minutes. He points to objects in books and	The child uses at least 10 signs and acquires new signs. He starts to use pointing as pronouns	MOTHER NAUGHTY	

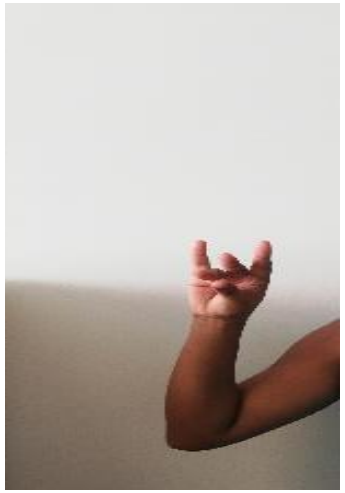
	word sounds that have the meaning of a sentence and in the correct context, like *mamma* and pointing at the bottle, meaning *I want the bottle.*	answers simple questions non-verbally and tries to imitate simple words like *cat* and *mamma.* He follows simple instructions like *don't touch* and understands simple questions like *Where is the cat*? The child would ask for the same stories and rhymes to be repeated.	for example *HE* or *THAT*. The child recognises more signs and he starts creating signs for things or make up easier signs for difficult handforms e.g. *MOTHER* (flat B handform moving, he will make it with no movement and at the wrong place).		**Baby signs** MOTHER  NAUGHTY 

		.			**<u>Adult sign</u>** MOTHER  NAUGHTY 
18-24 months	<u>Stage 3: The two-word sentence stage:</u> This stage will be reached by the age of 18 months. The sentence now usually contains a verb and a	The child enjoys it if someone reads to him and can produce sounds made by animals. He starts	Babies with deaf parents have a larger vocabulary than hearing babies at this time but in a few	DOG BITE	

	noun. The sentences may also be supported by non-verbal communication for e.g. gestures and pointing and include other word types, such as adjectives or adverbs and that makes a more complex sentence, e.g. *dog big.*	pointing to body parts, like nose and mouth when asked where it is. He begins to use pronouns, like *mine.* The toddler will now understand two stage commands like *take your book and put it on the table.* He starts noticing sound of the doorbell or phone ringing and will get excited for you to answer or even try to answer themselves.	months, this advantage will disappear. The child begins to use appropriate facial expressions. He uses signs with the basic hand forms and movements like up and down. He combines two and three signs to make sentences. The child will start to sign stories about things here and now. He will copy facial expression from different people and characters from stories he likes.		**Baby signs** HURT and then point to the dog.  **Adult sign** DOG 

					BITE 
2-4 years	<u>Stage 4: The multiple word sentence stage</u>: This stage is reached between the age of two and two and a half years. This is where grammatical morphemes are used as prefixes and suffices to change the tense of the sentence, e.g. *dog is big.* <u>Stage 5: The more complex grammatical structure stage</u>: This stage can be reached between the age of two and a half and three years. The child starts to use more complex grammatical structures, like asking questions, making longer sentences e.g. *Where is daddy?* Or *Mommy, where is my daddy?*	The child understands about 50 words and is able to produce about 40 at around 24 months. He speaks in phrases of two to three words and uses question inflection to ask for something. He starts to use plural and past tense words The child answers simple questions and repeats sentences. He starts to group objects together and identifies colours. Understand simple "who?', "what?" and "where?" questions.	He starts modifying signs by himself. Conventional signs, like verb inflection will be used. He starts to communicate about objects and actions around them. The child begins to use classifiers and verb. He tries to use more complex signs with easy hand forms. He starts to use the correct facial expression with *yes/no*- and *Wh*-questions and demonstrates negation with the	I CAR DRIVE (movement is given to the car to make it driving)	**<u>Baby signs</u>** CAR –movement up and down to show driving 

		He hears and reacts when called from a different room. This is an age where problems with hearing loss can be noticed.	sign NO and a headshake. He refers to things around him during a conversation and copies the actions and facial expression of others. He starts to use signs for *MY* and *MINE* and some plurals. The child starts to recognise the difference between noun and verb pairs e.g. *PLANE* and *FLY*. He understands and uses classifiers for objects and the correct movement of these objects.		**<u>Adult signs</u>** CAR-DRIVE – movement forward to show they are driving  
5-6 years	<u>Stage 6: The adult-like language structure stage</u>: A child between the ages of five and six years will reach this stage. He can make complex	The child understands complex questions and can define words. He can describe how to do something and can	He is able to change movement in the sign and use the correct facial expression with signs to indicate	MOTHER HELP (movement of help toward him)	

	structural distinctions making more links between words. E.g. Articles, prepositions references, etc. He starts to use concepts like promise and ask, e.g. *what is the time?* Or *he promised to help me.*	list items in correct categories. The child understands more than 200 words and time sequences. He engages more freely in conversations and uses his imagination to create more stories.	difference in meaning. He points to people and things in the real environment and starts using the movement correctly. He also starts to use role-play[5] when telling stories, although it is not always clear who is speaking or doing something. The child starts to use more complex hand forms and movement e.g. wiggles the fingers, producing a "K" handform, "M" handform, "ANIMAL" handform. He begins to use topicalisation in conversations e.g. give the sign for	K handform; Animal handform;	**Baby sign** K-handform  Animal handform 

[5]Role-play: Role-play is the act of imitating the character and behavior of someone who is different from yourself. In SL you sign a story but taking on the role of the cat and the dog by just shifting your body to show who are you at that moment.

			TRAIN (topic), wait a second and then discuss the colour of the train. He starts using rhetorical questions e.g. *the boy is sad why*, wait a second and then says *because his mother is crying*. He starts using noun modifications e.g. repeat a sign to pluralise. He starts role-playing more frequently and more clearly to be able to make it more understandable to others.		**<u>Adult signs</u>** MOTHER HELP  

					K handform  Animal handform 

2.5 Critical Periods in language Development in Hearing and Deaf Children

According to Claudio, Toppelberg and Shapiro (2000), the first 10 years of a child's life have been characterised as the crucial time for optimal language development, while Sass-Lehrer and Bodner-Johnson (2003) see the first three years of a child's life as the 'magic' years, but so many confusing things happen around them. The reason for their confusion is only noticed by the age of three and by then there is already a lot of emotional strain on the whole family and they need help. The parents start to notice that this child is not developing like the others siblings or the child is just sitting and does not interact with the rest of the family. By this time, the parents notice the child may be deaf and go for medical help. This might be a problem for language development but if the parents get the necessary help and advice it might not be too late for language to develop. According to Tomlins (2015) when it comes to development in general the first three years are very important. Early intervention programmes can help parents and families to communicate with their deaf children. However, if the hearing loss is discovered after puberty, there is not much time left for early intervention.

According to Zeedyk (n.d) a human baby is born with neurological pathways that leads the baby to pay attention to certain things around him. Although babies are very small, they are social beings. When they are born, they are prepared to breathe and eat, just as they are prepared to communicate and connect with others (Zeedyk, n.d). A hearing baby is born and ready to communicate. With the interaction of people around them, they can hear and vocabulary is already starting to develop. Penfield and Roberst (1959) say that for the purpose of learning languages, the human brain becomes progressively stiff and rigid after the age of nine and when a second language is taken up in the second decade of life, it is difficult to achieve a good result because it is not the way the brain and language development work.

Lenneberg (1967) says that human language acquisition is an example of biologically constrained learning which means normal language development between birth and puberty. After puberty language learning becomes very difficult or alternative ways of learning must be applied. Even if the language was heard during early development, but never used or produced or not heard for a long time, the accent will be closer to a native accent compared to the accent of a person who started learning the language as an adult (Au, Knightly, Jun, & Oh, 2002). When an adult learns a second language, it might be difficult or nearly impossible to pronounce it in the native accent of the second

language and his own native language might influence the way the adult speaks the second language.

From the above it is clear that children acquire a language, spoken or signed, much easier if they are exposed to it from an early age. If a deaf baby is exposed to SL from birth or soon after, they will be able to use it on the level of a native language. If they are exposed to SL at a later age, acquisition is delayed which will have an impact on the fluent use and understanding of the language. The acquisition would even become more difficult after the age of ten years. Deaf children should, therefore, be exposed to SL during the critical age for language acquisition that is according to Vanhove (2013), from just after birth until puberty.

Learning a language at the critical age is not only important for language development, but also for cognitive development.

2.6 Cognitive Development

A definition of cognitive development by Mayberry (2002, p. 71) states that "Cognitive development is the product of a child's attempts to understand the family, neighbourhood, schools and the world at large during this period of rapid brain growth and learning." Piaget (1952) was the first psychologist to research cognitive development and he said that children are not limited to receive knowledge from parents and teachers, but they construct their own knowledge and learn from situations where things are personal, relevant and meaningful to them. To him cognitive development was a progressive reorganisation of mental processes because of biological maturation and environmental experiences (McLeod, n.d.). Piaget (1952) is also of the opinion that all children go through four stages of cognitive development, namely, sensorimotor, pre-operational, and concrete operational and formal operational, and also that you need one stage to develop to the next stage of cognitive development. Piaget had set out the first major theory of cognitive development, but his theory is very broad and more research on this topic was conducted by Crone and Ridderinkhof (2001). This will be discussed in more detail in Section 2.6.1.

There are three basic components highlighted in Piaget's (1952) cognitive theory. The first one is the sensorimotor component[6]. This refers to the way you learn, namely through your senses and through your actions. The second component is the preoperational component[7] that refers to

[6] Sensorimotor component: time of tremendous growth and change (Cherry, n.d).
[7] preoperational component: engage in symbolic play and learn to manipulate symbols (Cherry, n.d).

learning how to express your feelings through language, the ability to express your perspective, but also understand other people's views on it. The third component, called concrete operational[8] enables you to start to think logically and classify objects. These components are applicable to all people, hearing or deaf.

Vygotsky (1962) indicated that language and culture play a role in cognitive development and this is something Piaget did not note in his theory. Their studies indicated that infants and young children were cognitively more competent than suggested by Piaget. A child's development is a complex and varied process and, therefore, no single theory applies to all (Siegler, Eisenberg, Saffran, & DeLoache, 2005). A study done by Gilliam and de Mesquita (2000) indicates the important relationship between language and cognitive development. If the development of the home language is strong, it will support the continuity of cognitive growth. It is, therefore, important for a hearing and deaf child to develop a strong language basis from an early age. This will ensure that they are able to grow and develop on a cognitive level. Piaget (1952) referred to this as the logical way of making sense of things happening around them. Piaget defined a schema as "A cohesive, repeatable action sequence processing components actions that are tightly interconnected and governed by a core meaning" (McLeod, n.d., p. 1). The schema was seen as the basic building blocks for intelligent behaviour. Wadsworth (2004) says that schemata can be seen as index cards filled in the brain, each card telling you how to react to information.

Early education programmes for children received more attention during the last years as general awareness of the importance of early education was emphasised (Samuelsson & Kaga, 2008). These programmes focussed more on hearing children or children who use oral communication. There is a big need for programmes that focus on deaf children that use SL. Samuelsson and Kaga (2008) feel that the lack of early cognitive-academic programmes for deaf children put them in a disadvantaged position when they go to school.

Research of Di Paolo, Barandiaran, Beaton and Buhrmann (2014), indicated that representational[9] thoughts begin with the direct action and interaction with the environment, which happens during the sensorimotor time. It is important to note that their study was done with older children and the current study focuses on young deaf learners. Nevertheless, the current study wants to look at the same process to see whether there is a difference in the cognitive development of hearing children compared to deaf children and if language acquisition plays a determining role.

[8] Concrete operational: development of logical thoughts (Cherry, n.d).
[9] Representational: the intellectual ability to picture something in your mind (Cherry, n.d).

In a study done by MacNeilage (1998) with young deaf children between the ages of 23 and 38 months, the sensorimotor development was on par if compared to the hearing group, except for the vocal limitations. The results were compared with a control group of hearing children. A year later, some differences were identified. According to the researchers, it might link to differences in sensorimotor development between the hearing and deaf group which only start in the stage were the symbolic[10] function is developed. According to Piaget (1952), the symbolic function is one of the major developments after the sensorimotor period.

Not all researchers agree that there are differences in the cognitive development of hearing and deaf children. However, according to Musselman (2000) researchers agree that there is a difference in academic achievement if you look at the reading and writing skills of deaf and hearing children.

2.6.1 Cognitive Development in Young Deaf Children

According to research done by Mayberry (2002), multiple questions were raised when it came to the cognitive development in children who are deaf and do not have a spoken language. Some of the crucial questions asked are: "*Can a deaf child develop cognition without having a spoken language or the ability to hear? Can a deaf child develop inner thoughts even if he cannot hear anything? Does a deaf child without a spoken language have a mental block when it comes to cognitive development because he cannot speak? Can SL have the same influence in cognitive development as a spoken language? Can a child with no hearing develop the same way as a hearing child with a spoken language?*" In an attempt to answer the above questions one realises that the issue about cognitive development of deaf children are more complex than just brain development, because cognitive development is about the child's understanding about things around him. There are Deaf children, born into a Deaf family, that have no problems with language learning because they use their natural language from birth. They develop according to the language and social milestones as required.

According to Mayberry (2002), the effects of deafness on cognitive development are quite diverse and complex, because of the ways the families, communities and culture react and communicate with the deaf child, especially when the child does not spontaneously learn to talk. The cognitive development of deaf children who grew up with little or no exposure to any language in any form (sign or spoken) is a complex situation. A more complex situation concerning deaf children, is where

[10] Symbolic stage: During this stage the child master the ability to picture, remember, understand and replicate objects in their minds (Cherry, n.d).

children grew up with very little or no language exposure and where no or very little cognitive development takes place. In this study, all seven learners fall into the more complex situation and will be discussed in more detail in Chapters 3 and 4.

Deaf children in hearing families have a delay in language development, but their non-language cognitive development is on the same level as a hearing child, such as play behaviour and conceptual development. According to research done by Mayberry (2002), deaf children who use SL often show an above average performance when it comes to non-verbal IQ tests and visual tasks. When the children who participated in this study, arrived at Bartimea School (the school where this study was done), an IQ test was done by the Occupational therapist (OT), to see in which grade the learner would be placed and on which cognitive level the child was. There was no verbal test done because the LOLT of the school is SL and not speech.

To find out if hearing contributes to cognitive development, Mayberry (2002) further suggests that deaf children experience a delay in language development regardless of whether their language is spoken or signed. The delay in language development with deaf children does not cause general intellectual deficiencies in cognitive development that focusses just on language, but it can cause poor reading development. Language and non-language cognitive development is dissociable, because deaf children show normal early play and conceptual development if compared to hearing children. However, language difficulties can be changed around if children who are born deaf are exposed to language input in early childhood at the appropriate time. This might help children to overcome their problems easier (Humphries, Kushalnagar, Mathur, Napoli, & Padden, 2012).

There are several cognitive components that make up learning, for example, visual attention, memory, problem solving and creativity. Research by Marschark, Lang, and Albertini (2001) has shown there are cognitive differences between hearing and deaf. This idea will be explored in the next Section 2.6.2 about the stages of cognitive development.

The stages of cognitive development as mentioned in footnotes 5-9 discussed in more detailed in this section. Wood, Smith and Grossniklaus (n.d) discuss the four stages of cognitive development established by Piaget (1952). The stages of cognitive development are discussed in Section 2.6.2.1.

2.6.2.1 Stages of Cognitive Development

Sensorimotor stage (zero to two years):

This stage involves motor activities without the use of symbols. The physical interaction with people and animals around the child and experiences are still limited and thus the reason for limited knowledge. The child cannot predict any action therefore he has to learn through trial and error, such as putting something in his mouth or doing an action like shaking a bottle. Early language development begins in this stage and he starts to realise that something exists even if he cannot see it.

Pre-operational stage (two to seven years):

During this stage, the child starts to use language. He starts to have meaningful conversations and people around him can have conversations with him about a wide range of things like animals and food. His memory and imagination start to develop. He starts to engage in make-believe play and stories, understands and explains things from the future and the past. However, complex situations, like cause and effect, have not yet been learned.

Concrete operational stage (seven to eleven years):

Through the use of logical and systematic manipulation of symbols the child demonstrates his intellectual development. Thinking is not egocentric and the awareness of external events is happening more often.

Formal operational stage (11- adult):

The child starts to use and understand more abstract concepts. He is able to think in more systematic ways about multiple things, formulates hypotheses and thinks about abstract relationships and concepts. At this stage, the child starts to discuss different topics that interests him and therefor tries to find out more about that by asking many questions and looking for answers in many ways.

Cognitive development does not take place in isolation and, therefore, the environment where language learning takes place needs to be considered as well.

2.7 Environment for Language Learning

It is the responsibility of the parents, no matter if the child is hearing or deaf, to provide the optimum language learning environment (Hart & Risley, 2003). Not all parents spend the same amount of time talking to their children and this can have an influence on their language development. If the parent talks a lot to the child, the child is exposed to more vocabulary and more often grabs the pronunciation and meaning of the word (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991).

Deaf children from hearing parents might also have problems with inputs to their language development, because they cannot hear and they, therefore, respond very little to the parents' input. This is a difficult environment to learn and develop (Vandam, Ambrose, & Moeller, 2012) and will be discussed below.

2.7.1 Hearing Parents with Deaf children

The first year of a deaf child's life in a hearing family is very similar to the first year of a hearing child's life. The child enjoys multisensory communication with the mother and the rest of the family. The communication between the deaf baby and the rest of the family takes place as if the baby can hear. At this time, there might be no awareness that the baby is deaf and the family talks to the baby and plays with him like any family would. The family talks to the baby and the baby reacts on the facial expression and general gestures people use when talking. When the child does not develop language according to the milestones, the parents will only start thinking that something is wrong with the child between the ages of six to eight months. If a hearing parent hears that the baby is deaf, the reaction is totally different than a Deaf parent with a Deaf baby (Flaherty, 2015). For hearing parents, their deaf baby is normally the first contact with deafness and the parents do not know what to think or do. Parents react as if they did something wrong when they discover that their baby is deaf.

The earlier a child is diagnosed with a hearing loss, the earlier parents can get the support they need to accept the child's deafness and the fact that their child might use a different language as the family. Some parents might decide to learn SL to enable them to communicate with their child. If parents and other family members learn SL, there will be no communication problems in the family. This will ensure that the child goes through similar language and cognitive stages (Humphries, et al., 2017).

According to Allen and Anderson (2010), parents that are involved in their deaf children's lives by using SL, can help the deaf child develop to his fullest potential. Not empowering the parents of deaf children in using SL can be seen as an obstacle in language and cognitive development. According to Power and Leigh (2000), some parents do not want to be empowered because they feel that the professionals, who are experts in deafness, are equipped to make the right decisions on the development of the child. If parents do not want to learn SL, they might be in denial about their child's deafness (Kluwin & Gaustad, 1991).

Research done by El Nokali, Bachman and Votruba-Drzal (2010), has shown that the relationship and contact a parent and child have during the first three years of the child's life, play an important role in the language development of the child. The foundation that was laid by the interaction between a parent and a child during this period is fundamental for the rest of their language development, because the child picks up interaction words during conversations and this helps to make learning easier.

Markschark, Lang and Albertini (2001) say that deaf children do not have access to language role models who use SL, because about 90% of deaf babies are born to hearing parents and the parents do not use SL. Parents might struggle to come to terms with the fact that their child is deaf. The parents are unsure how to communicate with their child and it might happen that the deaf child is isolated and do not feel part of the family. Hearing parents are fluent language models for their hearing children, but hearing parents to deaf children are less prepared to make a language accessible to the child. If the parents decide to learn a SL, they learn it at the same time as the children and are not proficient language models for their deaf child (Marschark, Lang, & Albertini, 2001).

Hearing parents are most often not informed about how important visual communication with their deaf children is and this can have a big impact on language acquisition and cognitive academic achievements. Many times these children come to school with no or very little language and they develop language when they come to school and not before (Hrastinski & Wilbur, 2016).

Since this study is about hearing parents with a deaf child (see Section 2.7.1), the following scenarios, namely Deaf parents with Deaf children (Section 2.7.2) and Deaf parents with hearing children (Section 2.7.3) will be discussed very briefly.

2.7.2 Deaf Parents with Deaf Children

According to LaSasso and Metzger (1990), Deaf children from Deaf parents usually do not struggle with language acquisition, because they have been exposed to a natural SL environment since birth. Language and cognitive development of these Deaf children is on par with hearing children. Deaf parents would like to have a Deaf baby. When a Deaf parent discovers that the baby is Deaf, there is usually a lot of joy. Every parent wants a child with a reflection of themselves and a Deaf parent would, therefore, also like to have a child in an environment where communication is developed in a familiar way.

2.7.3 Deaf Parents with a Hearing Child

A hearing child in a Deaf family is raised similar as a Deaf child in a Deaf family. SL would be the child's first/natural language. These children are called CODA's, children of Deaf adults. They became the parents' interpreter from a very young age, but according to Green, Free, Bhavnani and Newman (2005) sometimes at a later stage they reject interpreting for their parents. They have had to deal with grown up situations, like interpret conversations between the parent and bank managers, from an early age. They have to interpret for their parents when the parents go to the doctor, have an appointment at the school, etc.

Apart from the environment in which language learning takes place, the culture of the deaf child, is just as important for language development.

2.8 Deaf Culture

From a social linguistic perspective, Deaf Culture, just like any other culture, is characterised by a common and shared language, identity, norms and hierarchy. The world out there is seeing Deaf people in a pathological view, meaning "we need to fix them", they need to hear. However, the Deaf community sees itself from a cultural viewpoint, meaning there is nothing wrong with them, they just use a different language. They accept themselves the way they are. Members of the Deaf community feels that being Deaf is a different human experience and they do not see themselves as disabled (Munoz-Baell & Ruiz, 2000). Deaf people that are born into a Deaf family, have parents who are also Deaf. Their native language will be SL and they will be part of a Deaf Culture from day one. A deaf child born into a hearing family will be part of the hearing culture until they go to school

and there they will associate with other Deaf people just like them. The Deaf community at the school is where the child will learn about his culture (Padden & Humphries, 2005).

SL plays a very important role in Deaf Culture. SL is important because just like hearing people they take pride in their own language (What is Deaf Culture? , n.d). SL binds Deaf people together. Many deaf children lack an effective medium of interaction until they encounter SL. As soon as they have a language (SL) they become part of the community and take part in things happening around them. Through SL the values, norms, history and artistic expression are given through to the younger generations. Without their language nothing of the important things can be preserved for the younger generation because if there are no signed stories there will be nothing for them to remember or to show their children to keep the culture, stories and traditions alive (Stander & Mcilroy, 2017; Clason,n.d; Ladd, 2003). Because many deaf children only learn about Deaf Culture at school, Deaf education becomes equally important to them.

2.9 Deaf Education

According to Rieser (2012), the education of deaf children is seen as a big mess or failure because it is compared with successful use of spoken language, for example English. Deaf children cannot acquire reading and writing skills in English if they do not have a language to communicate in so that they can learn the meaning and understand the words in English.

It was only in the late 1960s and early 1970s that families and children with disabilities, which included deaf children, got the right to equal educational opportunities through legislation (Sass-Lehrer & Bodner-Johnson, 2003). The process of teaching a child SL and a language for reading and writing, for example English, is not an easy process, but has been seen as an intervention for deaf learners by the education system. Going to school is a big step in the life of any child and his parents, because it is a process of change and the unknown. They know there is change coming but not sure what the change may hold in for them and this can generate feelings like fear, anxiety and insecurity for the parent and the child. The child will now establish relationships with more people. This will ask from both the parents and the school to put in more effort for adaptation.

Because of obstacles in Deaf education, the sooner the deaf child is exposed to teaching and learning, the better. Early intervention can make a big difference in deaf learners' education.

2.9.1 Early Intervention (EI)

EI is very important because of the critical time (see Section 2.5) a child has to acquire a language. It is important to remember that most deaf children have hearing parents with no or very little SL skills and, therefore, they arrive at school with limited language use and skills of either SL or the parent's language. When the children arrive at school with no or limited language skills, it makes it difficult for teachers to concentrate on, or follow the school curriculum (Gregory, 1996), because children must learn language simultaneously with other school subjects. Deaf children who are exposed to SL at an early age perform better academically than those who were not exposed to SL (Van Staden, Badenhorst, & Ridge, 2009). According to Sass-Lehrer and Bodner-Johnson (2003) these first three years of a child's life is seen as the "magic years" as mentioned before, because this is the time the child's character and capabilities are unfolding. The importance of early life experiences have a big influence in the development and acquisition of language and in cognitive and emotional development. "Young children with hearing loss may be short changed by programmes that focus solely on the development of language and communication skills" (Sass-Lehrer & Bodner-Johnson, 2003).

Research done by the Gallaudet Research Institution (2001) shows that at least one out of every three Deaf children not only has a hearing loss, but other developmental concerns. If the child's mother was a heavy drinker during pregnancy, it is highly possible that the child will suffer from Fetal Alcohol Syndrome, which might cause hearing loss. EI programmes and prolonged involvement in such programme give the parents the opportunity to learn more about their child's needs and what the future can hold. The future is different for each child but EI programme help the parents to make decisions that will be best for the child and the family. Decisions include school placement, what language will be used to communicate with the child and if hearing aids and other devices will benefit the child.

Moeller (2000) did research on EI and language development with children that were deaf and hard of hearing. The study was done on children who were identified at different ages. The research indicates that many of the children with sensorineural hearing loss achieved language abilities very similar to hearing children if intervention programmes were provided by the age of six months. Moeller (2000) states that in general, early intervention contributes to good language development. Children that were enrolled in programs at 11 months had stronger vocabulary and verbal reasoning skills at five years old than children that were enrolled later on. Studies by Moores and Meadow-

Orlans (1990) and Moeller (2000) show that deaf children who are exposed to signing at an early age perform better in the academic stream than those who were not exposed.

According to Guralnick (2000), EI is not only the responsibility of professional people like doctors and teachers, but responsibility has shifted more to the community and family. EI must be a combined effort between professional people and the parents, because they share the responsibilities of the child's development in all elements. McBride and Mills (1993) enforce the idea that families should be assisted to participate more in early intervention programme and become more involved in the monitoring thereof. Parents must get assistance and advice when they find out that their baby is deaf, not just medical advice, but also advice such as where to learn SL, school placement, among others. Therefore, decisions about the deaf child must involve intensive consultations between parents and professionals (DesJardin, Eisenberg, & Hodapp, 2006). Doctors and other professionals like audiologists and social workers play an important role when it comes to the diagnosis and intervention of deaf children at an early age.

Many times a child's hearing loss is only discovered after the age of two and that means the relationship between child and family cannot develop into a meaningful one because of no or very little meaningful communication. If there is EI, the parents and the child learn important skills that are necessary to have meaningful communication (Sass-Lehrer & Bodner-Johnson, 2003). The parents of deaf children have to make many decisions about communication that parents of hearing children do not have to make.

Parents tend to send their deaf children to a boarding school as soon as they can for many reasons, but the most important reason is because of language barriers. It is easier to send a deaf child away than for the parents to learn a new way to communicate, sad but true. In the Deaf community, if s Deaf persons are asked where they are from, they will give you the school's name and not the place where their parents live. The main reason for this is that the school is the place they learn about Deaf Culture and have other Deaf people around them who understand them (Mcilroy, 2011). When they are at home, they need to follow a hearing culture and most of them do not really understand everything, because people do not or cannot explain it to them and communication is limited (Clark, n.d).

In summary, EI is a problem all over the world that affects not only the children, but also their education and future dreams. Deaf education is a global problem and has its own challenges in South Africa, as explained in the Section 2.9.2.

2.9.2 Deaf Education in South Africa

South Africa has 44 schools for Deaf children, which form part of the Department of Education. It is not always clear whether the Department is aware of what is needed to make the school of the Deaf a place where Deaf children can acquire the necessary knowledge and where meaningful learning can take place. People involved in special needs schools must have sufficient and appropriate knowledge about the needs of these children before they can make decisions that will have an influence on learners' lives (Stander & Mcilroy, 2017).

Human resources are needed in education for deaf children to meet their specific needs. The school must promote their values and attitudes that lead to learners' participation and process of skills acquisition that will support lifelong learning. For deaf learners the school is a place to meet other deaf students and social interaction with other Deaf people is very important (Clason, n.d).

The education system for deaf learners needs to include people who are experienced with the Deaf or people with knowledge about deafness, to help education for deaf learners to be on par with the education for hearing learners. A major problem is that in most cases, schools are far from the child's home and, therefore, the learners have to go to a residential school. Although this is very good for the learners' natural language development, the parents are not included in the child's development and when the learners go home, there are no or very limited mutual language, as mentioned previously. Communication between parents and children relies on gestures and not SL.

Inclusive education refers to education where everybody, with or without a disability, attends the same class or school. Inclusive education in South Africa is regulated by policy. According to Storbeck, Magongwa and Parkin (2009) the Department of Education released a document, White Paper 6, where the problems in Deaf education were mentioned. It was realised that to improve Deaf education and get it equal to hearing education, focus needs to be on language and communication. They acknowledged SASL as the language for teaching and learning (LOLT) and the need for teachers with qualifications in special education and knowledge of SL. Inclusive education suggests that deaf and hearing children must be in the same classroom, but this will not be effective because the deaf learners will rarely be included unless an interpreter is used. Furthermore, this is no guarantee that it will be equal education (Storbeck & Martin, 2010).

The choice of language for communication and teaching might also be a problem if deaf, hard of hearing and hearing learners are in the same class. If a spoken language would be used, e.g.

English, there will have to be an interpreter. This might distract learners to listen to the teacher while so many other things are happening around them. This situation is not ideal, because there would be different learners in the class and different teaching methods should be used. It is also possible that some learners with special needs might slow down fast learners who will get irritated or bored. This implies that equal education will not take place and that many learners might get lost in the system, especially learners with special needs (Bamu, De Schauwer, Verstraete, & Van Hoven, 2017).

It can be concluded that apart from the challenges in Deaf education, deaf learners will also be part of a bilingual system, inside and outside education, which is not necessarily a negative factor. This will be explored further in Section 2.9.3.

2.9.3. Bilingual-Bicultural Education (BiBi)

All deaf children, whether they are born in a Deaf family or in a hearing family, will always be involved in two worlds, the Deaf world and the hearing world. A Deaf child born into a Deaf family and a home where SL is used will encounter vocal/spoken languages outside the home. It is highly likely that most Deaf children will become bilingual-bicultural. Deaf learners from hearing parents go to school without any language and minimum communication skills and it is only at school that they start to learn a language of communication. Because of late language exposure, the learners' cognitive and language development fall behind. Hearing children go to school fluent in at least one language.

According to Grosjean (2010), bilingualism is dual-language acquisition, in a one-person, one-language home environment. BiBi, the approach used in the teaching of deaf children, aims to develop both a SL and a written language. This is when SL is seen as the first language and the written language as the second language. One of the benefits of the programme is that deaf children are given access to a visual language and a written form in education.

Bilingualism has taken on different meanings over the last 20 years. Educated means that you are bilingual in many countries and can speak more than one language (Bonfiglio, 2017). A bilingual environment does not cause any harm to children. Bilingualism for a hearing child is good, but for a deaf child it is essential because this is the only way that the child can acquire a language to communicate in. With their mother tongue, SL, they can acquire a second language to read and write in and through that communicate with the hearing world. Deaf people "speak" their visual

language and use a second language for reading and writing. This is seen as bilingualism, BiBi (ScienceDaily).

The fact that one of the two languages of Deaf people is SL, could mean that they are not really bilingual, but such a view reflects an ignorant perspective that SL is not a real language. As discussed in Section 2.2.1 SL is a real language. Staying in boarding schools for the Deaf indicate that deaf learners are BiBi, because they have a Deaf Culture at school and then a hearing culture at home.

If children are born in a deaf home, the parents use SL, but outside the home they will be in contact with hearing people and the hearing world. The parents still want the child to learn a second language so that they can also become part of general society. If a child is born into a hearing family, the parents speak vocally and the parents want the child to have the same language as the family. Many times the parents invite Deaf people to be part of their lives so that the child can have the influences of Deaf people and their language. Thus, this child is also involved in the hearing and the Deaf world. All deaf children will become BiBi because they function in two different communities and cultures, deaf and hearing (Thumann-Prezioso, 2005).

As mentioned before, more than 90% of Deaf children do not have parents with SL skills. Therefore, by the time they go to school they have only limited communication skills. Many deaf children come to school with minimal language skills, compared to hearing children from hearing families who are fluent in their first language by the time they go to school (Humphries, Kushalnagar, Mathur, Napoli, & Padden, 2012).The children struggle with any form of communication because they had no language interaction during the formative years for language development

According to Grosjean (2010) bilingual education is the best way to ensure that deaf children get early exposure to SL and a spoken/written/reading language. Exposure to more than one language gives the child the chance to acquire both languages successfully. It took a while for people and linguists to recognise that SL is a real language (Humphries, et al., 2013). Deaf children from hearing families are struggling with communication and not only because the lack of introduction to SL, but rather because of no introduction to any language. According to Grosjean (2010), bilingual education is the best way to make sure that the deaf child has early exposure to SL and a spoken/written/reading language; this will help the child with language acquisition in both languages.

2.10 Summary

In this chapter, the linguistics and development of SL were discussed to show its importance as an equal to any other spoken language. The milestones and the similarities in hearing and deaf children when it comes to language development were discussed, as well as the critical period in language development and the influence it has on language and cognitive development.

This chapter indicates that no or very little communication is taking place in hearing families with deaf children. The communication of the child develops when they enter school but then the parents still have little or no communication with the child. A Deaf child born into a Deaf family grows up with good communication between parents and children. This child knows his Deaf Culture by the time he goes to school. However, when a deaf child from a hearing family goes to school, he encounters Deaf adults. Only then does he obtain information about his own culture and language, i.e. Deaf Culture and SL.

Chapter 3: Methodology

3.1 Introduction

This chapter focuses on the methodology used in conducting this study. Information about the target group and area where the study was conducted, are shared. Specific aspects relevant to the selection process, criteria for selection and the background of the participants are discussed in order to provide a clear understanding of the participants and their relevance in the study. A mixed method research method was used in the gathering of data. Qualitative data was gathered through observations. A quantitative method was use to sort the data according Krippendorf's (2004) method and data was analysing through the Likert scale, tables and graphs in Excel. The process of data collection, and the way the data was analysed and interpreted, are discussed in this Chapter.

3.2 Background of the Participants

The study was done at Bartimea School for the Deaf and Blind in Thaba Nchu, one of the 44 schools for the Deaf in South Africa, and one of two schools for the Deaf in the Free State. Bartimea School is situated approximately 50km from Bloemfontein in a rural part of the Free State Province. The school accommodates deaf and blind learners from the age of four, Grade R, up to school-leaving age, 18 years and older. The majority of learners are accommodated in the school's boarding facilities and the school could, therefore, enrol learners from all over South Africa and Lesotho, which is in close proximity to Thaba Nchu. Deaf and blind learners are accommodated in different sections of the school and do not share the same classrooms. For this study, seven profoundly deaf learners in the foundation phase class in Bartimea School participated.

Specific sampling was used and all the learners in the foundation phase class were subjected to the activities and observations during the research. The participants form a homogenous group because of the following common factors: all participants stay in the hostel, all have hearing parents, all started school for the first time late in the previous year, in the beginning of the research or shortly afterwards. None of the participants has prior exposure to formal education, pre-school or crèche. All the participants have been profoundly deaf since birth or lost their hearing shortly after birth. They can, therefore, not use or benefit from spoken language. None of the learners knew SASL, as they had no previous exposure to it. Due to the degree of the learners' deafness, none of the learners makes use of a hearing aid or other forms of sound amplification.

Ages of participants in this study vary from five to seven years. Although age is not a common factor amongst the participants, the findings of the research will not be jeopardised because the learners are all learners in the foundation phase class with no knowledge of SL. Reasons for late identification of deafness and admission to school are discussed in Chapter 2.7.1. As previously mentioned, all participants are from hearing families who use spoken language (Sotho, Tswana, Xhosa, etc.) at home. The family usually communicates with their deaf child by either speaking, using gestures or developing their own "home sign" system. "Home signs[11]" is a system invented and created by hearing family members of a deaf child to enable them to have some form of communication. These signs might be more iconic or picture-like in nature. "Home signs" are different from gestures that are commonly used by hearing people. Parents and/or the deaf child use a self-invented 'sign' every time they use a specific spoken word. Gestures on the other hand refer to "a motion of the limbs or body made to express or help express thought or to emphasize speech" e.g. using arm movements to indicate "go away" (Sign Language , 2018). Participants might use their own "home signs" to try to communicate with their peers and teachers at the school, although these signs might not be understood.

As mentioned above, the learners in the foundation phase class participated in the research and it is the first admission to formal education for all the participants in the study.

3.2 Class

Three of the seven learners arrived in the beginning of the previous year of the study. Another participant arrived at the end of the previous year. His exposure to SL is seen on the same level as the three learners who arrived in the year the study started. The above factors are taken into consideration when the data is analysed. When the research commenced, most of the learners in the class could sign basic concepts as learned in the first few weeks of school and in the hostel. The ages of the learners vary between four and seven.

3.3 Consent and Permission

The Department of Education in the Free State gave written consent for the research to be conducted at the mentioned school, with the condition that data collected during the study would remain the property of the Department and that research material and video recordings of the participants would not be made public. The identities of learners should be protected at all times (see Addendum 3A). To ensure this condition, names of learners were changed to ensure

[11] Home signs are signs made up by hearing family members to communicate with their deaf child in the home. These sign do not have meaning to other people because signs differ from family to family.

anonymity. Research data and video recordings were stored in a locked cabinet in the researcher's offices. Written permission for the study was also obtained from the school, class teacher and class assistant of the specific class used in the study (see Addendum 3B).

As required when working with children, a vulnerable group, consent from parents or guardian of the child is of utmost importance. A consent form was given to the parents of the participants. The consent form (see Addendum 3C) was written in English only but a Sotho interpreter was used to interpret the content to the parents. The reason being that some of the parents are not fully literate and therefor would not understand written English or Sotho. This procedure was followed with all the parents. Parents or guardians signed a consent form, giving permission for the recordings to be used for data collection and that the findings and the results of the study may be published. As mentioned before, the children's and teachers' identities were kept anonymous in order to protect them and to preserve the objectivity of the research.

Ethical clearance for this study was granted by the University of the Free State (Ethical clearance number: UFS-HSD2016/0329 (see Addendum 3D).

During this research, no harm was done to the participants, physically or emotionally. Although the researcher formed a trusting relationship with the participants, they were informed that the researcher would only be present for a specific time. Teachers and assistants remained the consistent factors in the learning environment.

3.4 Research Methods and Procedures

This study used a mixed-method research approach. This method focuses on the gathering and analysis of both qualitative and quantitative data. The study started with an in-depth literature study including important aspects about SL that need to be understood in the context of this study. Furthermore, the study focuses on the developmental stages of language and cognitive aspects as well as information to understand specific problems experienced by hearing families of deaf children.

In the empirical study, direct interaction with the participants, as well as observations were used to gather data, which is a common method for gathering data. The data was collected over a seven-month period (March to September 2016) and there were different time intervals between the activities. Interaction with the participants was restricted to between 30 and 50 minutes to ensure that the participants stayed focused. Early morning proved to be the best time for the interaction and

observation, as the learners were not yet tired. Research was done within school hours and school terms, in the participants' natural environment.

To establish a trusting relationship, the researcher did not interact with the learners on a formal level or gather any data during the first meeting. The teacher, who informed them that the researcher would visit them on a regular basis, introduced the researcher to the participants. This was to ensure that the learners felt comfortable with the researcher. As a video camera was used to record interactions, learners were exposed to the camera during the first meeting, allowing them to touch the camera and to look at themselves on the camera. This made them comfortable with the presence of the camera during class time. By the third meeting, when the research started, the participants did not even notice the video camera that was placed in front of the class behind the researcher.

During the data collection phase, the researcher interacted directly with the participants in a formal class situation. The interaction between the researcher and participants was video-recorded for analysis by the researcher at a later stage. Observations made when learners interacted with the teacher's and class assistant, were not part of the research.

3.5 Data collection

For data collection, the interaction between the researcher and participants was planned and prepared. Sessions varied between 30 and 50 minutes. Interaction was restricted to these times to ensure the learners were able to concentrate for the specific period of time. The collection of data was done through specific activities. Some activities were completed within one session, while other activities stretched over different time frames and time intervals (Chapter 4.1).

Activities included short stories that were signed to the learners. The objective of this activity included testing of memory, identifying specific characters, understanding of sequence, etc. Flash cards of works or pictures were used to evaluate the participants' ability to link a sign with a picture or word. Drawings done by the participants were used to evaluate the participants' understanding of specific signed events/stories. Table 3.1 provides an overview of the activities that the researcher used to gather data.

Table 3.1 Overview of Activities in the Class

Activity 1: Establish relationship with researcher
A story called “My family and I” (Pienaar, 2010) was used for this activity. The learners did not know the story and it was signed to the learners. Questions were asked to ensure that the learners understood the researcher and that they were relaxed with the researcher in the class.
Questions were asked after the story to see if the learners understood what the researcher signed, for example: Tell what the story was all about. How many people came to visit? Why did they have a party? Whose party was this?
This activity was done in one session and lasted about 45 minutes.
The teacher and the class assistant were present during this session.
Activity 2: Story recall
The researcher used a story that was prescribed for this grade, namely, “Phuti is born” (SLED, 2006). The story is about a mother, father, three sisters and a newly born baby brother, Phuti, who is born deaf.
The story was signed to the learners and the book was used to show pictures of the story to the learners. After the story was signed, the learners had to answer questions about the story and draw pictures of what they could remember about the story. The researcher asked each learner to explain their drawings.
The following questions were asked in this activity: What is the baby’s name? What did the family do in the field? When they walked home, what did the girls carry? How many animals were at the house? The following activity was done: Draw a picture about the story.
The activity was done over two sessions of approximately 40 minutes each, two weeks apart.
The class assistant was present during the sessions to assist the learners if clarification about a sign was needed.

Activity 3: Story recall delayed
A DVD, of the same story as in Activity 2, was shown to the learners. The story was signed by another signer on the DVD to see if the learners could understand the story. This story was signed two weeks after the first story was signed by the researcher. Questions were asked to the learners to see if they understood the signer on the DVD.
The following questions were asked in this activity: What were the sisters' sign names? Who was in mommy's tummy? What was mother doing? What was baby sister doing? What did they see while walking home? Who came with the taxi?
An activity was given to the learners to draw the three sisters and the baby brother in the story. The researcher asked each learner to explain their drawing and the researcher wrote down the names of the objects or persons next to it. The activity was done in two sessions of about 35 minutes each over two weeks, a week apart.
The class assistant was present during the sessions to assist with any signing if needed and to help the learners with their activities at their tables. She also had to assist in helping the learners concentrate on their own activities and not move around between tables.
Activity 4: Letter-word identification
The researcher used two sets of cards; one card with a letter on it and one with a picture.
It was expected of the participants to give the sign for the picture on the card and identify the handform.
The activity was done in one session of about 35 minutes.
The class assistant was present during the session to assist with any signing if needed.
Activity 5: Picture vocabulary
The researcher signed and the learners had to identify the object from the cards with a picture of the object in front of them.
The activity was done in one session of about 35 minutes.
The class assistant was present during the session to assist with any signing if needed.
Activity 6: Oral comprehension
Pictures were given and learners had to make up the ending of the story.

As the story had no definite end, each participant had the opportunity to determine the ending. Pictures were used during the signing of the story and learners had to pick a picture and explain what they thought would happen at the end.
The activity was done in two sessions of about 30 minutes each, a week apart.
The class assistant was present during the sessions to assist with any signing if needed.
Activity 7: (Visual) Reading vocabulary
Cards with a picture were presented to the learners.
The researcher signed and the learners had to match the sign with the picture.
The activity was done in one session of about 30 minutes.
The class assistant was present during the session to assist with any signing if needed.

Apart from the above, the original test by Woodcock-Johnson III Tests of Achievement (WJ III ACH) (Wendling, Schrank, & Schmitt, 2007) was designed to include written and oral skills, was used in the study. The researcher however had to adapt the test to include deaf children. The test was adapted by including drawings and signs in the place of writing and the signing was in the place of the oral skills, because the learners used SL and not a spoken language to communicate. The test was adapted to evaluate the participants' understanding and use of SASL rather than their writing. The analysis of the recordings of the different activities provided the researcher with data to draw conclusions and make recommendations. Refer to Addendum 4A for the test and adaptations. As SL is a visual language, the researcher relied on the video-recorded data as no notes could be made during the sessions.

3.6 Data Analysis

The data analysis was done by the researcher, using the content analysis method for qualitative research. Content analysis is a widely used qualitative research technique (Hsieh & Shannon, 2005) (Krippendorff, 2004) to examine patterns in communication in a replicable and systematic manner. Content analysis shows three approaches: conventional, directed and summative approach and all three are used to interpret meaning from the content. This content includes a different kind of text and in this study audio-visual (video recordings of activities) text was used because the research was gathered with learners signing their understanding as well as through their drawings. To assist the analysis, rubrics from the California School for the Deaf were used (adapted by the researcher to fit the study).

3.7 Summary

This chapter provided an overview of the participants, research methods used in the study as well as how the data would be gathered and analysed. As seen in this chapter, existing tests had to be adapted to accommodate SL users. All activities had to be video-recorded to make sure the data could be analysed. Very little data gathered, except for the drawings made by the participants, were provided on paper, as SL is a visual language. Visual representation of data is, therefore, of utmost importance. With this information in mind, the data is analysed in Chapter 4.

Chapter 4: Results and Discussion

4.1 Introduction

This chapter deals with the analysis of data collected (see Section 4.3), as well as the results and outcome of each of the seven activities mentioned in Chapter 3. From the results, specific conclusions are drawn which link to the hypothesis and aim of the research. An analysis and discussion of the drawings done in Activity 2 and 3 will be provided. Following this, Section 4.4 will provide a general discussion on the data analysis and results of each of the seven learners.
The data was captured over a period of seven months (March until end of September 2016) with different time intervals between the activities. These can be summarised as follows:

Interval between Activity 1 and 2:	two weeks
Interval between Activity 2 and 3:	two weeks
Interval between Activity 3 and 4:	eight weeks due to school holiday
Interval between Activity 4 and 5:	two weeks
Interval between Activity 5 and 6:	two weeks
Interval between Activity 6 and 7:	one week

The difference in time lapse between the activities had an influence on the outcome and the results of the test and activities. Section 4.4 provides an in-depth discussion.

4.2 Analysis of Data

As discussed in Chapter 3, Section 3.5, the instruments used during the analysis of the data included video recordings and drawings, the Woodcock-Johnson of Achievement - WJIII test (Woodcock, Kevin, McGrew, & Nancy, 2001) (see Addendum 4A), rubrics (see Addendum 4B and 4C) and content analysis (Krippendorff, 2004). More detail on the analysis of the data collected through these instruments and how it was done, will be discussed in Section 4.3. The rubric for assessment of SL expressive and receptive skills from the California School for the Deaf was adapted and use by the researcher (Education and Resources Center, n.d). See Addendum 4B and 4C for the rubrics.

Although there were 16 learners in the class, only seven completed all seven activities that were done in the ten sessions of which one session was used for introduction. Activity 2 took place over two sessions and the last session was a conclusion of all the activities. Only the data of those learners who completed all seven activities was analysed and will be discussed. The reason being

that some learners joined the school at different times and dates during the research (details provided in Chapter 3.) Although these learners participated in some activities, data is excluded in the analysis to ensure that the data used is reliable.

The different activities as well as the data collected according to the Woodcock-Johnson test during the research are summarised in Table 4.

Table 4: Aims and Facts

Activity number	Activity name	Activity description
Activity 1	Signing story: My family and I	Testing if they understood what the researcher was signing because she was new to the learners. Also testing whether they felt comfortable with the researcher signing and if they understood questions by the researcher.
Activity 2	Story recall	Recalling of a story after the signing of it. Drawing to show their understanding of the story.
Activity 3	Story recall - delayed	Determining if they could recall the correct sequencing of the story after a time delay of two weeks. Drawing to show the sequence of the story that the learners remember. The activity was done over a period of three weeks.
Activity 4	Letter-identification	Establishing if the learners could identify the letter (hand form) of the sign that was made by the researcher. They had to match the correct picture of the hand form with the finger spelled letter card.
Activity 5	Picture vocabulary	Testing if they could match a picture on the card with the sign that was signed to them.
Activity 6	Oral comprehension	Determining if the learners could “discuss” the picture that was shown to them.
Activity 7	(Visual) Reading vocabulary	Testing if the learners could give the signs or sign names of the characters in the story. Pictures of the characters were shown to the learners.

The researcher observed and recorded learners during specific activities as described in Table 4. These activities were specifically done to obtain data related to the learners’ signing and understanding skills to determine if they were on a language level appropriate to their age. Memory, recall and cognitive skills were also tested during these activities through the story recall and story delay recall (see Activities 2 and 3). The activities mentioned above, determined the learners’ language and cognitive development.

As SL is a manual language, the researcher was not able to take extensive notes during observation. Therefore, video recordings of the sessions were made and observed afterwards to make sure the researcher did not miss any details. These recordings were used as the data that was analysed. The results of the analyses are discussed below (see Section 4.3). The Likert Scale method was used to assess each learner's level of signing as well as their cognitive development. These skills were analysed and recorded by using the scale as follows:

1 = Very poor; 2 = Poor; 3 = Average; 4 = Good and 5 = Very good (see the key[12]).

4.3 Analysis of Results

The discussion of the data of each participants are sorted in a random order for all activities. The discussion of the results of the participants however are kept in the same random order in each of the activities.

Activity 1

Activity 1 was used to determine the level of understanding of SASL. Although it was the second session with the researcher, (the first time being a get-to-know session), this was the first activity and therefore it was a fun and interactive to establish a good relationship between the researcher and the learners. In this activity, the learners observed the story, "*My family and I"* (Pienaar, 2010), signed by the researcher. Afterwards they answered four questions based on the story. The researcher supported her signing through the use of pictures depicting the story. The observations are reflected in Table 4.1. The real names of the learners are withheld in this study to protect their identities.

Table 4.1: Activity 1 - Story

Name of learner	Understanding according to Likert scale	Signing according to Likert scale	Repeated/answered questions (signing)	Looked for help at
Karabelo (age 7)	2	3	All questions	Peers
Mpho (age 6)	2	3	Repeated peers' and researchers' signing	Peers

[12] KEY: Very Poor (1): No fluency, no understanding, nearly all wrong. Poor (2): Not very fluent, very little understanding, mostly wrong signs. Average (3): Somehow fluent, some understanding, some correct signs. Good (4): Good fluency, good understanding, most signs correct. Very good (5): Very fluent, very good understanding, nearly all signs correct.

Silias (age 7)	1	1	Repeat the questions and then looked at peers for help	Peers
Ben (age 6)	3	3	Answered some questions	Researcher and class assistant
John (age 6)	1	1	Copy-signed[13] everything	At researcher
Sussie (age 5)	2	2	Copy-signed what was signed to her.	Peers
Mapaseka (age 6)	2	1	Repeated most of peers' signing	Peers

John, Sussie and Mapaseka were new learners who started school at the beginning of the same year in which the research was done. Silias started school very late in October of the previous year and therefore can also be viewed as a new learner. Karabelo, Ben and Mpho stated attending school during the previous year and therefor they had basic knowledge of SL. They were not in school for the whole of the previous year and thus repeated the year.

In this first activity, Karabelo's signing skills (level 3) were slightly better than his cognitive skills (level 2) and the reason for this might be because he had been signing for a while and it was already part of his daily life. This explains why he could communicate with the researcher and understood questions and commands. The reason why his cognitive skills were slightly lower could be that he was not familiar with the researcher's signing. Another reason could be that his attention span was very short.

Very much the same can be said of Mpho. His cognitive and signing skills were also on level 2 and 3 respectively. Despite this, he was uncertain about his signs and repeated his peers' and the researcher's signing.

Although Silias started school at the end of the previous year (around October), his signing and understanding skills were still very poor (level 1). He repeated all the questions and looked at his peers for help. This could be due to several reasons, including the fact that the school holiday at the end of the year was quite long, six to eight weeks, and he could have forgotten what he had learned. He only attended school for about a month before the long holiday and at home, no communication

[13] Copy sign: Copy-signing does not necessarily mean that a person understands what is signed. Copy-sign can be compared to something that can also appear in spoken language, like copying what someone is saying and repeating it.

in SL took place. These factors contributed to the fact that he could be regarded as a new learner who had to learn everything from scratch.

Ben was in this class the previous year and thus his cognitive and signing skills were better than his peers' (level 3). Despite this, he could not answer all the questions. The reason for this could be that these types of activities (from the research) were new to him and made him feel unsure about himself.

John acquired signs very quickly, although he did not always understand the meaning of the signs. He being an introvert, not socialising and playing with peers, might explain why his signing and understanding were very poor (level 1), even though he copy-signed. More information will be provided about this in the discussion of the results (Section 4.5).

Sussie, on the other hand, was a very outgoing girl who was very eager to participate and this could be the reason why her signing and understanding were at a slightly higher (level 2). She was also very eager to learn and acquired signs very quickly. She also copy-signed what was signed to her, because she did not always understand the meaning of the signs.

Mapaseka participated eagerly in the group but was very unsure about herself when placed on the spot. This could be the reason why her signing was very poor (level 1) when she was asked a question directly. Although she was new to the situation and also new to using these skills, her understanding was slightly better (level 2) when the question was put to the group.

Communication problems between the researcher and these seven learners were encountered due to learners' limited SASL vocabulary and their signing skills as well as their understanding of the language.

Activity 2

This activity specifically collected data related to memory. In this activity the learners had to recall what happened in the story, "*Phuti is born"* (SLED, 2006) and answer questions directly after the story was signed to them. This activity was done to assess their ability to remember by answering and understanding direct instructions. The researcher asked eight questions about the story and the learners needed to answer from memory. The analysis of the data is captured in Table 4.2.

As part of this activity, learners also had to draw the story as they recalled it. A typical instruction was “Draw what you can remember of the story or draw the family members”. The reason for the activity was to obtain further data on how the learners understood and recalled the story. Learners were also asked to draw the story “*Phuti is born”* (SLED, 2006). The learners could use their own imagination in their drawings as no specific instructions were given (see Addendum 4C). The activity had a second section where the researcher used the drawing to ask questions about the story and had discussions around the drawings. The drawings of the learners had more details and here the researcher could see who understood the story and who not. Analysing the learners, drawings provided important insights into how drawing fits into the overall physical, emotional, and cognitive development of the young child (Crosser, n.d).

The drawings that the learners made during the sessions were analysed and are discussed in the additional columns under “Drawings” in Table 4.2.

Table 4.2: Activity 2 - Story Recall and Drawing[14]

Name of learner	Understanding and remembering according to Likert scale	Signing according to Likert scale	DRAWINGS		Repeated/ answered questions (signing)	Looked for help at
			Understanding (Likert scale)	Drawing (Likert scale)		
Karabelo (age 7)	5	3	4	4	Repeated what peers signed; answered seven out of eight questions correctly	Peers
Mpho (age 6)	2	3	4	4	Copy-signed but answered three of the eight questions correctly; explained more about his drawing.	Researcher
Silias (age 7)	1	3	2	3	Copied peers. Did not answer any question. No explanation about his drawing.	Peers and class assistant.

[14] The drawings were analysed according to the methods of Crosser, n.d. Drawing skills were not analysed but focus was on understanding of the content of the stories.

Ben (age 6)	2	3	2	3	Repeated peers' answers. Tried to answer two of the eight questions.	Peers and class assistant
John (age 6)	2	2	2	2	Copied and repeated questions	Peers and class assistant.
Sussie (age 5)	2	2	1	1	Copy-signed what researcher signed. Answered with help from peers.	Peers
Mapaseka (age 6)	1	2	1	1	Copy-signed researcher. Answered only one question.	Researcher

The learners observed the story and most of them copy-signed the researcher. Karabelo was able to answer seven out of the eight questions correctly. This indicated that he understood the story and could recall what happened. His drawing was good. He draw all the characters of the story and could explain what they were doing. His understanding and cognitive skills were slightly better than his signing skills. The reason for this could be that he enjoyed the story and could answer the questions about the story. He struggled a bit with fingerspelling and handforms.

Mpho struggled to keep his focus on the researcher and the story. He was easily distracted and this could be the reason why his understanding and recalling of the story was poor (level 2) in the first part of the activity. However, in the second part, the drawing, his skills were a little higher (level 4). Mpho's drawing had many details about the story and he could sign/tell the story to the researcher using his drawing. These skills were on level 4 and he really understood the story by using his own drawing. The picture helped him to explain the story the way he wanted to but could not do it with only his signing.

Silias' understanding in the first part of the activity was very poor (level 1), because he was only copy-signing his peers' questions and answers. Both his signing (level 3) and his cognitive skills (level 2) were slightly better in the second part of the activity where the drawings were used to discuss what happened. The reason for this might be that the picture assisted him to recall a little of the things that happened in the story.

Ben's understanding in both parts of the story was poor (level 2) because he repeated his peers' answers and he could not tell the story by using his drawing. The reason for this could be the same as for Silias, namely, that he could not remember the story. Another reason could be that he did not understand the story or the activity well. However, his signing skills were a bit higher (level 3). As SL was a new skill to him, it became very important for him to sign correctly.

John also copied and repeated the questions. In both parts of the activity, his cognitive and signing skills were on level 2 (poor). It almost seemed like he was oblivious of what was happening in this activity. Alternatively, he could have completely misunderstood what was expected of him.

In the first part of the activity, Sussie's signing and cognitive skills were poor (level 2), but it was even worse in the second part of the activity (level 1). It could be that she either did not understand or remember the story. This was evident in her drawings that consisted of only shapes and letters and were not about the story at all (see Addendum 4D). Her drawings were not on the level of what is expected from a child of her age. Various reasons could contribute to that.

Mapaseka copy-signed the questions. She was dependent on the researcher for support and therefore her understanding was very poor (level 1) in both parts of the activity. She did not understand the questions and could only answer one of the eight questions. Like Sussie, her drawings were poor and only consisted of shapes and letters, which is not on the level expected from a child of her age (see Addendum 4D).

The reason for the low scores could be that all the learners copy-signed the whole story while the researcher was signing. In John, Sussie and Mapaseka's case, they were all new to the school and were only exposed to SASL for a short period of time. Their poor performances could be a result of a few possibilities, i.e. that their muscle control and coordination were not fully developed; and that they were emotionally not ready for these activities (Crosser, n.d)

Activity 3

Activity 3 was done over a period of three weeks. In Activity 3, the learners had to recall the same story, "*Phuti is born"* (SLED, 2006) that was signed to them a week before. The activity was done over a 2-week period with a week between the sessions. The activity was done to see if the learners could reconstruct the story from memory two weeks after it was told (signed).

In the second part of the activity, the learners had to explain the story in chronological order by drawing it on a grid with eight blocks. The learners had to discuss the story in a group with the researcher present. The researcher asked ten questions about their drawings of the story and wanted to see if the learners could remember the story after a week's delay. The focus was not to test if the learners could draw everything perfectly (see Addendum 4D), but to test the learners' long-term memory and whether they could explain the story in the correct sequence of events. Observations that were made can be seen in Table. 4.3. The drawings that the learners made during the sessions were analysed and are discussed in the additional columns under "Drawings".

Table 4.3: Activity 3 - Story Recall Delayed and Drawing

Name of learner	Understanding and remembering according to Likert scale	Signing according to Likert scale	DRAWINGS		Repeated/answered questions (signing)	Looked for help at
			Understanding (Likert scale)	Drawing (Likert scale)		
Karabelo (age 7)	3	4	5	2	Answered five of the ten questions correctly; answered questions about the drawing very well	Peers
Mpho (age 6)	2	3	4	5	Repeated the questions and then answered two of ten questions correctly; gave good answers to questions on the drawings	With answers and information from peers
Silias (age 7)	2	2	3	5	Repeated the questions and looked at peers for help. Did not answer any questions on his own without assistance, but gave very good explanations and answers on the drawing	Peers
Ben (age 6)	2	3	4	3	Answered four out of ten questions correctly;	Peers

					gave good answers on the drawing	
John (age 6)	2	2	3	4	Repeated all the questions and gave limited answers on the drawing	Peers
Sussie (age 5)	2	2	3	2	Repeated the questions and limited answers to a few questions on the drawing	Researcher
Mapaseka (age 6)	1	1	1	1	Just nodded; no answers to the drawing	Teacher and class assistant

Although Karabelo could sign the whole story and his signing was good (level 4), only the beginning was in the correct sequence. This could be because of average understanding and/or memory of the story (level 3). Although he struggled with the drawing, his memory and understanding of the story was very good (level 5). He told the whole story in the correct sequence and detail when he was asked to explain his drawing. This could be because he enjoyed the first part of the activity that helped him to remember the story.

Mpho's signing of the story was average (level 3), but his understanding and memory were poor (level 2) because he could not remember the correct sequence. However, his understanding of the story in his drawing was good (level 4). He gave good answers and good details about the story. Although he drew only the characters from the story, he was able to answer questions about the identities of the characters, activities or movements of the characters, for example, *where did the mother go*? Or *What did the little sister do?*

Silias' understanding, memory and signing were poor (level 2) as his peers had to help him to answer questions and he would copy-sign them. Although Silias' drawing was very good (level 5), his understanding and memory were average (level 3). However, his drawing helped him to gain confidence in signing. He also drew only the characters, like Mpho, but all his characters and their actions were drawn in detail e.g. walking home with wood on their heads.

Ben's understanding and memory in the first part of the activity were poor (level 2) and his signing was average (level 3). He was unsure about his answers and would look at his peers before he

would give an answer. Ben's understanding and memory in the drawing part of the activity were good (level 4) although the drawing did not contain all the details of the story and was incomplete. However, he could still sign the story in the correct sequence.

The reason for John's poor understanding, memory and signing (level 2) could be because he waited for his peers' answers and then copy-signed what he could remember. John's cognitive and signing skills in the drawing were slightly better than in the first part of the activity (level 3 and 4 respectively). This indicates that he remembered the story well. The reason for this could be that he enjoyed the first part of the activity, which helped him to remember the story.

Sussie signed short parts of the story, but not in the correct sequence. Therefore, her understanding, memory and signing were poor (level 2). Her understanding in the second part of the activity was a bit higher (level 3), but her drawing was poor (level 2) and not very clear. The reason was that the details did not come from the story but were her own ideas.

Mapaseka' understanding, memory and signing were very poor (level 1) and a possible reason for this could be that she seemed withdrawn. When the researcher asked her a question, she would look down and started playing with her fingers. This was possibly due to the fact that she had not yet acquired the necessary skills to communicate in a class situation where more than one student spoke at the same time. Another reason could be that she was not used to the researcher instead of the teacher asking the questions. Her drawing was only a scribble without any meaning that could not be understood. This indicates that her muscle control and coordination were not fully developed and that she was emotionally not ready for this kind of activity (Crosser, n.d). When the researcher asked her about her drawing or what happened in the story, she only copy-signed what the researcher signed, although she could give the baby's sign name. This explains why she obtained very low scores (level 1).

The drawings might assist in triggering the learners' memory. According to Kellogg (1970), drawings can help learners to talk about the story, but also help with other ways to communicate and give more confidence to make up conversation. Another reason why some of the learners' drawings were not clear could be that they were not familiar with drawing objects; lack confidence in drawing; or did not have the appropriate skills to draw. According to Kellogg (1970), learners use their drawings to start a conversation with each other and use it for social interaction with their parents or other adults. Furthermore, children between the ages of two and three start drawing types of shapes like circles, triangles and squares and, by age three, they start to put the shapes together to form objects.

A child that struggles with these types of drawings might still have problems with muscle control and coordination or something might still not be ready for that type of activity. This normally happens when a child is only exposed to drawing with different tools later in life and still needs to get used to the shape and idea of it. Children at the age of six and seven draw about things that they know about and like. By the time a child is ready for school, a child is focused on the emotional demonstration of things (Erikson, 1986).

Activity 4

Activity 4 was more advanced than the other activities, where learners had to match picture cards with finger-spelled letters cards in front of them. Fifteen different cards with different objects of finger spelled letters and pictures were randomly used in this activity (see Addendum 4E). For example, the researcher signed something to them, like CAT, and they had to pick up the card with the picture of the cat or the finger-spelled letter 'C'[15] that was in front of them. The researcher assessed if the learners could match finger spelled letters or signs with the correct card. The observations that were made can be seen in Table 4.4.

Table 4.4: Activity 4 - Letter-Word Identification

Name of learner	Understanding according to the Likert scale	Signing according to the Likert scale	Repeated/ answered questions (signing)	Looked for help at
Karabelo (age 7)	4	4	Nine out of ten correct matches	None
Mpho (age 6)	2	3	Four out of ten correct matches	From peers with picture in hand
Silias (age 7)	2	2	Two out of ten correct matches	Class assistant
Ben (age 6)	3	2	Six out of ten correct matches	None
John (age 6)	1	2	No correct matches	Teacher, class assistant and peers
Sussie (age 5)	1	2	Three out of ten correct matches	Peers
Mapaseka (age 6)	2	2	Four out of ten correct matches	Class assistant

[15]  the finger spelled letter C

Activity 4 was on a high cognitive level, and also happened after a school holiday of eight weeks, which might explain why the learners found it difficult and struggled with it. It took more time to complete the activity because the researcher had to make sure they all understood what they had to do in the activity. Despite the higher cognitive level of the activity, Karabelo' understanding and signing improved as he daily acquired new signs. When he gave the signs of the pictures, his face lit up when he was correct. He was proud of himself when signing and this was reflected in his cognitive and signing skills, which were both good (level 4).

Mpho's understanding was poor (level 2), because he looked for help from his peers when answering. He was also uncertain about the activity or what to do. However, his signing was slightly higher (level 3).

Because of Silias' understanding and signing being poor (level 2), he struggled with matching the finger-spelled letter with the card and could only match two out of ten cards correctly. However, he understood instructions without the researcher repeating the instruction.

Ben's cognitive skills were a bit higher (level 3) than his signing skills (level 2) in this activity. The reason for this might be because his return to school after the holidays was delayed and he had forgotten some of the signs.

John could not match anything correctly and therefore he showed very poor understanding (level 1) and poor signing (level 2). This could be because he was seeking help from everyone present and was amused by everything going on around him.

Although Sussie tried to do the matches, she had only three correct and looked at her peers for help. This resulted in very poor understanding (level 1) and poor signing (level 2).

Mapaseka's understanding and signing skills were both poor (level 2). The researcher struggled to convince her to try and match a letter and a picture at first but after she managed to succeed, she was very eager to try the rest on her own. She eventually managed to match four out of ten correctly. Compared to Activity 3, there was an improvement from level 1 to level 2 in understanding and signing, which was peculiar, since it happened after the holiday of eight weeks. For the first time, however, it seemed as if she was paying attention and reacted to what she understood.

The learners struggled with this activity and a possible reason might be because high order thinking was needed, and the learners might not have been ready for such activities yet. Another reason might be because of the long holiday without any stimulation in SL.

Activity 5

In Activity 5, different cards with pictures from the stories used in previous activities were shown to the learners and they had to give the SASL sign for the picture on the card. The aim of the activity was to determine if the learners could match similar objects e.g. matching the picture of a girl with the picture of Didi (the little girl in the story "My *family and I* " (Pienaar, 2010). Ten cards were used in this activity (see Addendum 4F). The observations that were made can be seen in Table 4.5.

Table 4.5: Activity 5 - Picture Vocabulary

Name of learner	Understanding according to the Likert scale	Signing according to the Likert scale	Repeated/answered questions (signing)	Looked for help at
Karabelo (age 7)	4	4	Matched nine out of ten correctly	None
Mpho (age 6)	3	3	Matched four out of ten correctly	Class assistant
Silias (age 7)	3	1	Matched three out of ten correctly	Peers
Ben (age 6)	2	1	Matched one out of ten correctly	Peers
John (age 6)	2	2	Matched one out of ten correctly	Class assistant
Sussie (age 5)	2	2	Matched five out of ten correctly	Class assistant
Mapaseka (age 6)	1	2	Matched one out of ten correctly	Class assistant and peers

In this activity, a lot of copy-signing took place and that can be seen in the learners' signing skills on the Likert scale.

Karabelo's confidence in signing his answers was noticeable in both his understanding and signing skills, which were good (level 4). This is an indication that he could manage the different skills concurrently, since he was slowly reaching a stable level on the Likert scale.

Although Mpho had an average understanding and signing (level 3), he still felt unsure about his signing and relied on the class assistant for help. However, the fact that both skills were on the same level is an indication that he was slowly stabilising in his cognitive and signing abilities.

Silias' understanding of what he had to do, was average (level 3), possibly because he could not remember the sign names of the characters. His signing was very poor (level 1), which is an indication that he was still struggling with understanding and using of SL.

Ben's levels of understanding and signing were lower than in the previous activities (level 2 and 1 respectively), because he could only match one pair correctly and could not remember the characters and/or their sign names. His signing skills in this activity were very poor (level 1), which could be an indication that he was struggling to use the different skills equally.

Although John's signing and cognitive skills were both poor (level 2), it could be an indication that he was slowly managing both skills on an equal level and that he was reaching stability.

Similarly, Sussie also showed poor understanding and signing (level 2). However, she managed to match five pairs correctly and felt very proud of herself. This could mean that she also started to manage different skills simultaneously and was achieving stability in both skills.

Mapaseka's signing was poor (level 2), but still slightly better than her cognitive skills (level 1). Some of her signing was gesture–like, for example, *hallo, food* and *drink,* which are basic signs used on a regular basis. *Food* and *drink* are iconic signs and, therefore, easy to remember. With this in mind, it seems that there was little progress in her understanding of SASL and her use of SASL. This is an indication that she was also still struggling with both skills and did not know how to use these skills simultaneously.

Activity 6

Activity 6 learners had to sign everything that was on the picture cards (see Addendum 4G). Pictures on the cards included concrete objects like *girl, boy, car, family, house,* sign names of *Didi* and *Dudu,* as well as abstract words like *happy*. Learners also had to indicate that Didi is a girl, Dudu is a boy, and that the two were not the same. They had to explain that there were two cars, a red one and a yellow one and that the mother drove the red car. The picture cards were shown to the learners and they had to match the correct picture card with the questions. Different questions were asked to the learners e.g., there would be picture cards with two differently coloured cars in front of the

learners and then the researcher would sign *mother*. They had to pick the red car, because that was what the mother was driving. Alternatively, cards with pictures of a girl or a boy would be shown to the learners and the researcher would, for example, give the sign name for Didi and the learners had to pick the picture card of the girl (Didi). The learners were asked ten higher-level, complex questions about the cards and these required more understanding and cognitive thinking. The data gathered in this activity can be seen in Table 4.6.

Table 4.6: Activity 6 - Oral Comprehension

Name of learner	Understanding according to the Likert scale	Signing according to the Likert scale	Repeated/answered questions (signing)	Looked for help at
Karabelo (age 7)	4	4	Copy-signed questions before giving answers; answered four out of ten questions	None
Mpho (age 6)	2	3	Copy-signed questions before giving answers; copy-signed Wh-questions but did not answer them.	Peers
Silias (age 7)	2	2	Could not give answers	Teachers
Ben (age 6)	3	3	Copy-signed questions before giving answers; did not answer directly	Peers and class assistant
John (age 6)	2	1	Repeated researcher's signing	Class assistant
Sussie (age 5)			No answers given	Peers
Mapaseka (age 6)			No answers	Look at everybody in the class

This activity was done after a two-week holiday, which means that the learners did not have any exposure to SASL during this period. They were still busy adapting to being back at school and a lack of concentration was a problem during this activity. They were eager to sign and discuss their holiday, but they were not actively participating in the activities. Being back at school, away from the family, or the higher level of answers expected from the learners, might have an influence on the outcome of this activity.

Despite of the above, Karabelo's signing and understanding skills were both good (level 4). This could be an indication that Karabelo managed to use the different skills concurrently. In spite of the fact that he had been exposed to SL for more than a year, he was unsure about his answers, and, therefore, he only answered four out of the ten questions correctly.

Mpho's understanding was still poor (level 2), but his signing was slightly better (level 3), possibly because he managed to give the sign names of the characters of the story. Although he was also exposed to SL since the previous year, he still copy-signed the WH-questions without answering them. Copy-signing of the questions might be his way of trying to make sense of the question.

Silias' cognitive and signing skills in this activity were both poor (level 2), because he could not answer any of the questions correctly. Another reason could be that the teacher and his peers did not assist him and, therefore, he did not understand what was expected of him.

Although Ben only answered one question correctly, he showed an understanding of all the questions. He preferred to discuss and repeated the questions, rather than answer them directly. This could be an indication that he wanted to make sure he understood the questions first before attempting to answer. He had also been exposed to SL for more than a year, which could be the reason why his understanding and signing were both average (level 3). It could also mean that he was slowly beginning to manage both skills simultaneously.

Because John only copy-signed the researcher, his signing skills decreased from poor (level 2) in previous activities to very poor (level 1) in this activity. However, his cognitive skills stayed on level 2, which could be because he did not answer any questions correctly and gave irrelevant answers.

Sussie and Mapaseka did not participate in this activity and, therefore, no score could be indicated. Possible reasons could be that they either did not understand the activity or that they were distracted or just not interested.

Activity 7

In Activity 7 learners had to match a picture card with something in SASL signed by the researcher (see Addendum 4H). They in turn, had to repeat the sign to the researcher. These picture cards were based on stories they already knew. For example, the researcher showed the sign for bakery and the learner had to choose the correct picture card that match the sign and had to repeat the

sign. The researcher used 10 picture cards and signs in this activity. The observations from this activity can be seen in Table 4.7.

Table 4.7: Activity 7 – (Visual) Reading Vocabulary

Name of learner	Understanding according to the Likert scale	Signing according to the Likert scale	Repeated/ answered questions (signing)	Looked for help at
Karabelo (age 7)	5	4	Ten out of ten correct answers; matched picture with sign correctly	Peers
Mpho (age 6)	4	3	Six out of ten correct answers	Peers
Silias (age 7)	4	3	Six out of ten correct answers	Peers
Ben (age 6)	4	3	Nine out of ten correct answers	Peers
John (age 6)	2	3	Four out of ten correct answers	Class assistant
Sussie (age 5)	2	2	Two out of ten correct answers	Peers
Mapaseka (age 6)	2	1	Two out of ten correct answers	From peers

In this activity, most learners improved from the previous activity (Activity 6), because there was only one week in-between the two activities. Karabelo's cognitive skills improved from good (level 4) on the Likert scale in the previous activity to very good (level 5) in this activity. He managed to answer all ten questions and matched the cards with the signs correctly.

Mpho's cognitive skills also improved from the previous activity (from level 2 to level 4), which could mean that he was gaining more understanding of the activities and their content. However, his signing skills stayed the same (level 3), which could be an indication that he was slowly stabilising in that area.

Silias' skills improved from the previous activity to this activity in both areas; his cognitive skills went up from level 2 to level 4 and his signing skills went up from level 2 to level 3. This could be indicative of the possibility that he was succeeding in managing both skills and gaining more understanding of the whole exercise.

Ben's skills in both areas stayed very much the same, except for his cognitive skills, which went up from level 3 in the previous activity to level 4 in Activity 7. This could mean his understanding and cognitive abilities were improving and that his signing abilities were stabilizing.

Although John's signing skills improved to level 3 from previous activities, his cognitive skills were still poor (level 2). It almost seemed like he did not understand was expected of him. He returned late to school after the holidays, as mentioned earlier, and not being exposed to SASL for a while could be the reason for his poor performance.

The same can be said about Sussie. Both her cognitive and signing skills were still on a level 2 (the same as in Activity 5), probably because she did not participate in Activity 6 at all. She did not understand what was expected of her and it almost seemed like she was either oblivious of what was happening around her or she had lost interest in the activity.

Although Mapaseka also did not participate in Activity 6, her understanding in this activity was slightly higher than in Activity 5 (from level 1 to level 2), but her signing skills came down to level 1 from a level 2 in Activity 5. Like Sussie, it was also evident that she did not understand what was asked of her and she seemed uninterested in the activities.

4.4 Discussion of Results

Table 4.8 gives a brief summary of learners' language and cognitive development. A more detailed discussion follows below.

Table 4.8: Language and Cognitive Development[16]

Name of learner	Language Development	Cognitive Development	General
Karabelo (age 7)	• Language was on basic level. • Improved a lot over the year. • Could explain his feelings and experiences.	• Second year in school. • Still struggling in beginning of the new year. • Unsure what he had to do. • Became more positive as language developed. • Became more willing to try new things.	• Language, cognitive and social development improved significantly due to language and experience-rich environment.

[16] Although language and cognitive development are indicated in two separate columns in Table 4.8, it was tested as one entity.

		• Copied his peers' stories at first. • Understanding of signs and meaning of words improved. • Was the top performer in this class.	
Mpho (age 6)	• Limited language but developed when entered school hostel (see Chapter 3.3). • More exposure to signing than at home. • Language became more understandable. • Started to ask or tell something.	• Improved a lot in understanding of what was asked of him. • At first relied on his peers but more confidence later. • Started to try to show the rest what he could do.	• Very eager to show everyone his answer after being told he is correct.
Silias (age 7)	• Really struggled to understand what was asked of him. • Struggled to explain his feelings.	• Understanding of the questions, signing and pictures improved. • Started to convey information.	• Introvert with little confidence to sign in front of class. • Sign with confidence one on one.
Ben (age 6)	• Attended school from previous year. • Very unsure in the beginning of the current year to sign or ask something. • Confidence improved a lot. • Started to help peers and new learners.	• Limited understanding at first. • Confidence in language usage improved. • Very impatient to wait for peers to answer questions if he knew the answer.	• Always ready to help/show peers sign or answer.
John (age 6)	• Copy-signed language • Pretending to answer but was only copy-signing.	• Slow reaction in answering questions.	N/A
Sussie (age 5)	• Limited meaningful language. • Developed slowly but surely.	• Understanding improved with increased copy-signing. • Try to create own sentences.	• Being the youngest, she was over eager to acquire knowledge and skills.

			• Confidence improved with development. • Very confident whether answered correct or wrong in front of class.
Mapaseka (age 6)	• Very limited language use • Repeated meaningless signs.	• Very limited understanding.	• Possible other factors involved but not part of the study.

Figure 4 shows the individual learners' signing skills and cognitive development. Although the results are based on the Likert scale, decimals were included for the following reasons: it gives a more accurate reading of the learner's performance; the averages of the individual learners were calculated over the seven activities; these averages also include the scores of the drawings in Activity 2 and 3. Therefore, the numbers put in brackets in the description below, indicate these averages, e.g. 3, 7 means somewhere between level 3 and 4 on the Likert scale.

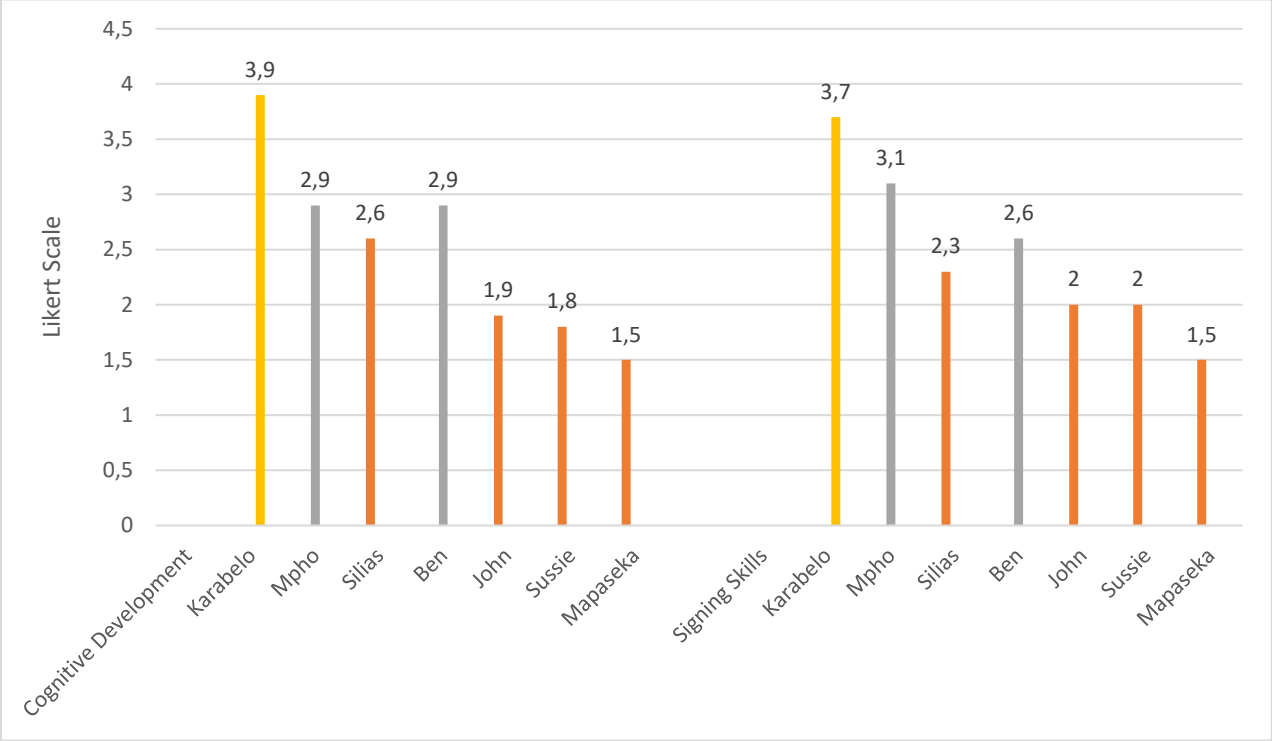


Figure 4: Evaluation of Learners' Cognitive Development and Signing Skills

In Figure 4 it can be seen that Karabelo's cognitive development was just below good (3, 9), while Mpho and Ben's development was just below average (2, 9). Silias's skills were also just below

average (2, 6), while John and Sussie's skills were just below poor (1, 9 and 1, 8 respectively). Mapaseka's cognitive development was between poor and very poor (1, 5).

As far as their signing skills are concerned, it is clear that Karabelo's skills have improved the most (3, 7), while Mpho's skills were just above average (3, 1). Ben's and Silias' signing skills were below average (2, 6 and 2, 4 respectively). John and Sussie's signing skills were average (2), while Mapaseka's signing skills were between poor and very poor (1, 5).

The signing skills and cognitive development of each learner are discussed in more detail in the sections below during the seven different activities. The time that passed between the activities might have had an influence on the outcomes and results of the test.

4.4.1 Karabelo

Figure 4.1 shows Karabelo's performance in all seven activities, including the two drawing activities (Activity 2 and 3). 'Understanding' includes memory and cognitive skills as well as the drawings, since they include the cognitive development of the learners (Crosser, n.d.).

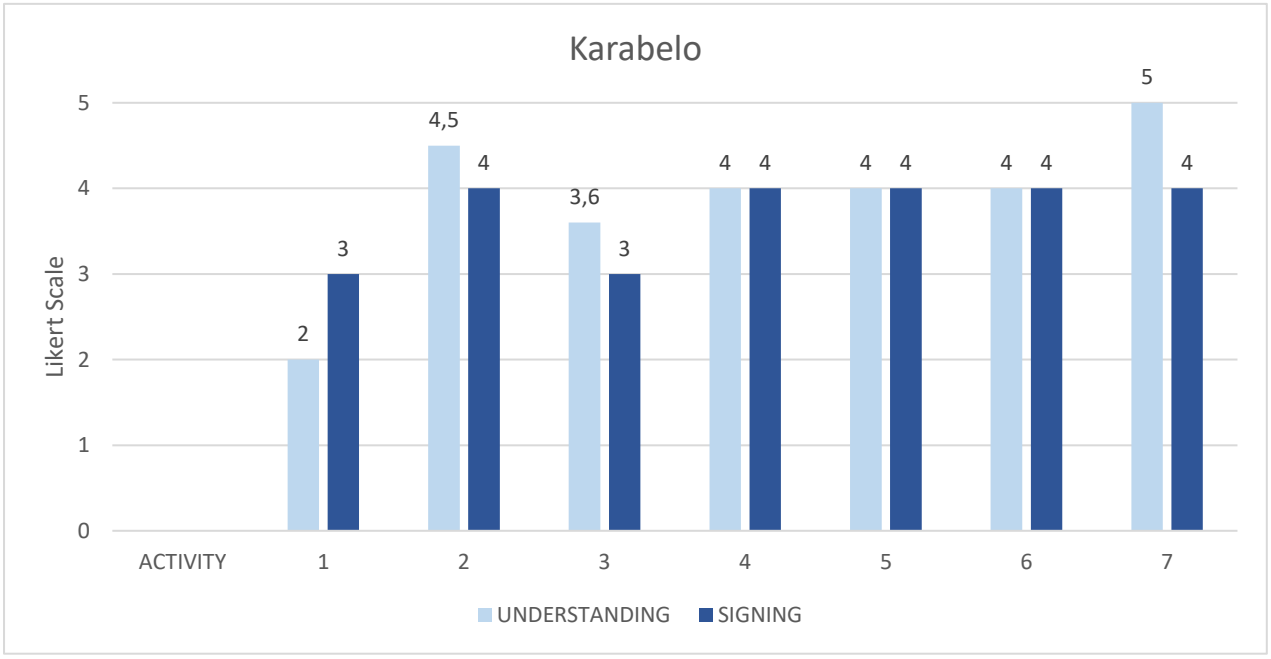


Figure 4.1 Karabelo

Karabelo is the only deaf member in his family. At the time when the study started, he was seven years old and did not use hearing aids. He was enrolled in the school for the first time in 2015, the year before the research was done. At the start of the research, his use of handforms were good, and he always tried to use the correct handform the first time. His signs did not always have facial

expression and that changed the meaning of his signs. He also struggled with facial expression in the WH-questions, but he could do the signs.

In Figure 4.1, it can be seen that the levels in both Karabelo's skills improved from the first to the second activity. They dropped in Activity 3 but stabilised over the following four activities and his cognitive skills reached a level 5 in Activity 7. In the first two activities, he did not always understand the questions and would first copy-sign before he tried to answer the question. His fluency was not that good because he was unsure about the signs in Activity 1, but in the following activities, his signing really improved in both fluency and correctness. He understood basic vocabulary e.g. *colour in, sit at the table* and could sign it.

He could understand simple questions, but sentences that were more complex needed to be repeated in Activity 1. His signing skills were 'good' and 'average' throughout the study (between a level 3 and 4 on the Likert scale), but as far as his cognitive development was concerned, he developed a bit slower. He could remember the story the researcher told them, and he could understand and answer the questions. He looked at his peers and sometimes copy-signed what they said.
During the recall delayed activity (Activity 3), he remembered the story (*Phuti is born* (SLED, 2006)), although the sequence of the story was not correct. This could be why his signing skills level dropped in this activity to level 3. His drawing was a very detailed representation of the story. The letter-word identification was a good activity for him in which he performed very well. When something was correct, his face lit up and he was very proud of himself and wanted to try again. His comprehension improved, and he could answer more of the questions correctly. This gave him more confidence in signing.

Regardless of the challenge in higher cognitive abilities in Activity 4, Karabelo improved in both skills. The eight-week holiday did not seem to interrupt his development, but rather served as a booster for his progress from Activity 4 onwards, since he improved in both skills and stabilised mostly on level 4.

However, with the oral comprehension in Activity 6, he was inconsistent and struggled with some of the questions. He copy-signed the question again, before he signed the answer. Again, in Activity 7 he did very well in the reading vocabulary as well in the understanding/cognitive skills. Only one week passed between Activity 6 and 7 and that could have been the reason for this. He could match every picture with the correct sign. The more his language developed over the year in which the

research was done, the more his confidence grew to answer questions. It was clear that he learned from his mistakes.

In conclusion, Karabelo did well in both signing and cognitive development and showed a lot of potential to become a fluent user of SL. From Figure 4.1, it seems as if stimulation from the necessary activities over a longer period will ensure stability in the different skills.

4.4.2 Mpho

Figure 4.2 shows Mpho's performance in all seven activities, including the two drawing activities (Activity 2 and 3. 'Understanding' includes memory and cognitive skills as well as the drawings, since they include the cognitive development of the learners (Crosser, n.d.).

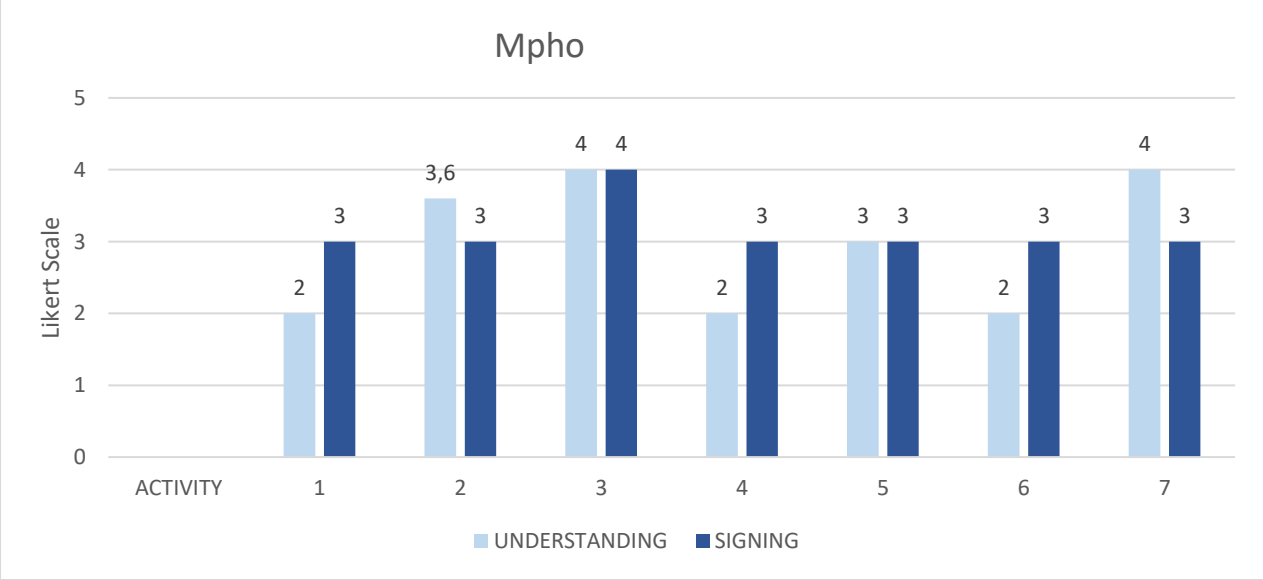


Figure 4.2 Mpho

Mpho is also the only deaf member in his family. He was six years old at the time the research started and did not use any hearing aids. He was enrolled in the school for the first time in 2016 (the year in which the research was done). He struggled with the use of correct handforms in the beginning, but these improved a lot during the study. Initially he did not use any non-manual features, but these improved a lot towards the end of the study. At first, he had a "scared" look on his face, because all the new signs made by the other learners and the researcher overwhelmed him.

Eventually he overcame these emotions by acquiring more signs and used appropriate facial expressions to support his signing. At the onset of the research, he sought help from his peers, but

by the end of the study, his peers sought help from him. He still struggled to answer and sign WH-questions. At first, he was unsure to answer questions, but because he assisted his peers, his confidence grew and the more he wanted to answer questions.

In Figure 4.2, it can be seen that Mpho's development in the first three activities was quite steady, but in the last four activities, he developed at a slower pace. He copy-signed all questions and could sign simple answers in Activity 2 and 3. If he did not understand the questions, he looked away. With the story, he repeated what the peers said and then answered the question. He could recall the story, but copy-signed many of the questions before he started to tell the story.

There was a small increase from Activity 2 to level 4 in Activity 3 in both skills. In this activity, with the use of his drawing, his signing increased, because he used his drawing to establish a conversation. Kellogg (1970) mentions that learners use drawings to form social interaction with people. Mpho's confidence also increased, so much so that he had conversations with visitors without being shy. His signing was more understandable in different conversations.
Because of the eight-week holiday, it caused an interruption in his development. His skills dropped to level 2 and 3 in Activity 4. This activity was more challenging than the others were and this could be why he struggled with this activity. It was either too difficult for him or his emotional state was not good after the holidays. It was as if he had to start all over again and slowly improved over the next four activities until his cognitive skills reached level 4 again in Activity 7. The pictures used in Activity 7 could have stimulated his memory in this activity and caused the improvement.

In conclusion, Mpho struggled with the first few activities, but the more his peers answered or signed, the more he wanted to be involved in the activities. Throughout the study, he struggled with fingerspelled words, which might be a reason why his signing skills stayed on level 3 (average) in six out of the seven activities. He needed some extra help with understanding of the activities, but once he understood the activity and how to do it, he managed on his own and even assisted his peers. The graph in Figure 4.2 clearly shows that his skills development follows a pattern of gradual improvement provided that he receives constant exposure and stimulation in these areas and are not interrupted by long time lapses.

4.4.3 Silias

Figure 4.3 shows Silias' performance in all seven activities, including the two drawing activities (Activity 2 and 3). 'Understanding' includes memory and cognitive skills as well as the drawings, since they include the cognitive development of the learners (Crosser, n.d.).

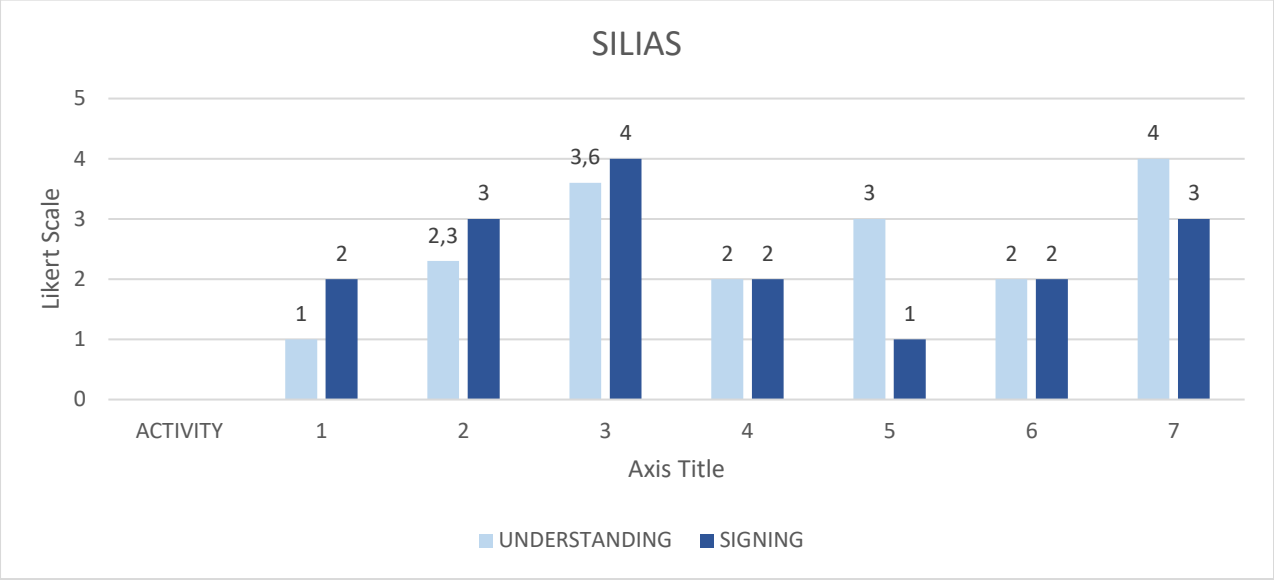


Figure 4.3 Silias

Like the previous two learners, Silias is the only deaf member in his family. He was seven years old at the time the study started and did not use any hearing aids. He was enrolled in the school the year before the research was done (2015), but very late in the year. He had no signing skills at the start of the research and used only basic vocabulary (*toilet* and *eat*), which he acquired at school.

In Figure 4.3, it can be seen that Silias' skills improved rapidly in the first three activities. He would copy-sign his peers when they were signing and sometimes tried on his own, regardless of whether it was wrong. He was very willing to try things and felt very proud when he tried to answer. He did not always understand what was asked or signed to him and would then copy-sign the researcher. He often understood the questions correctly, but still copy-signed simple questions and answered them for confirmation. At the start of the study, he had no or very little facial expression, but gradually he managed to use facial expressions with his signs, like the WH-questions.

After the eight-week holiday, he struggled to pull himself up as far as his understanding and cognitive skills were concerned. The level of both skills dropped in Activity 4 to a level 2. This could have caused him to forget some of the signs or he might have missed his family. Because this was a very challenging activity, it could have been too difficult for him. Another possible reason for this could be that he found the time lapse between activities too long.

There was a very slow improvement over the next four activities, but as his cognitive skills improved, his signing also improved. His signing skills dropped to a level 1 in Activity 5, probably due to copy-

signing. Copy-signing might be a good way to get more confidence in signing initially, but it might become an obstacle later on when the learner does not think independently and only copies his peers. This could have been what happened in Silias' case.

The signing and comprehension in Activity 6 seemed to be challenging for him, since both skills were on a level 2. He improved in his use and understanding of SASL and by the end of the study, he could explain things in detail. He eventually reached level 4 in understanding and level 3 in signing (Activity 7), but he was still very unsure about himself.

In conclusion, it can be said that over the seven activities, both Silias' cognitive and signing skills fluctuated a lot on the Likert scale, although he improved over-all in his signing skills. The reason for this could be that he was emotionally not ready for these activities. Another factor that needs to be taken into account is that language and cognitive skills were not focused on during the absence of the researcher. From the evidence, it is clear that Silias was very inconsistent. Nevertheless, he showed potential and with the necessary extra help, he could become a fluent signer.

4.4.4 Ben

Figure 4.4 shows Ben's performance in all seven activities, including the two drawing activities (Activity 2 and 3). 'Understanding' includes memory and cognitive skills as well as the drawings, since they include the cognitive development of the learners (Crosser, n.d).

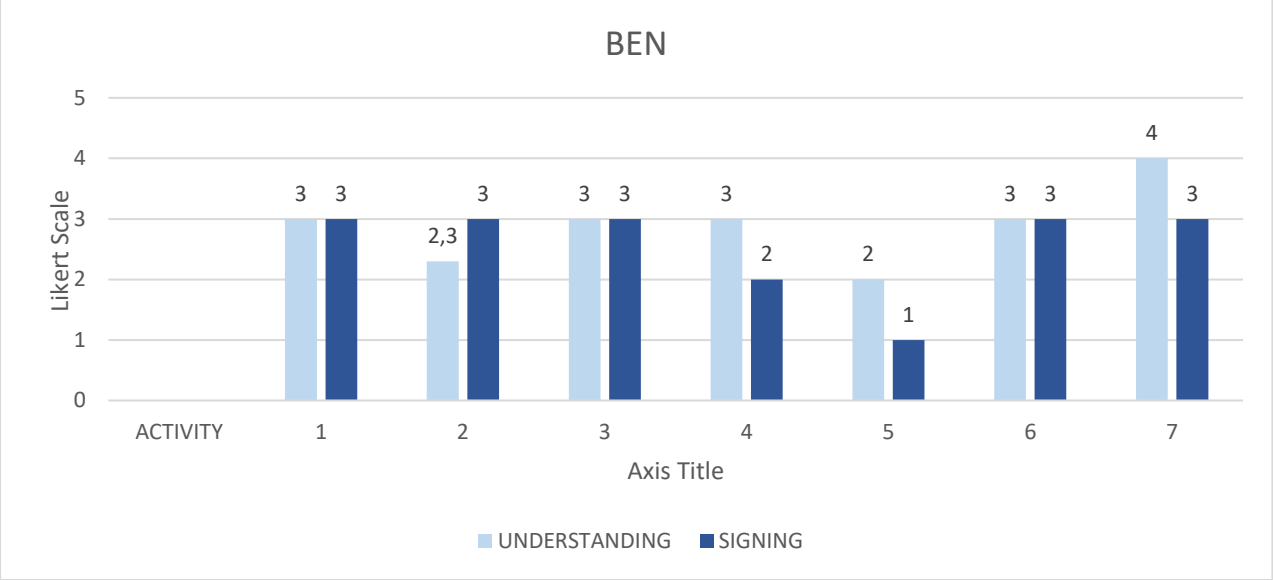


Figure 4.4 Ben

Like the previous learners, Ben is the only deaf member in his family. He was six years old at the time the study started, and he too did not use any hearing aids. Because he was enrolled in the school in 2015, the year before the research was done, he had basic signing skills and also a basic understanding of signing skills. He also had a basic vocabulary like *yes*, *no, toilet* and *sweet*, that he used and understood. He probably acquired these signs because of the communication in the hostel and on the playground. Because he copy-signed many of the peers' questions and answers, he struggled with complex questions and answers. As he learned how to sign correctly, he started using facial expression with his signs.

The graph in Figure 4.4 shows that in the first three activities, Ben's cognitive and signing levels were very much on an average level (3). Although he did not remember everything that happened in the story *(Phuti is born*), he had a basic understanding of the story outline. Therefore, he could answer some questions by copy-signing his peers. He also wanted confirmation that he was on the right track before giving answers. It seems as if the delayed story recall was difficult for him. His drawing was only about the family (mother, three sisters and the baby) of the story and then he could not remember all the names of the family. After answering the question correctly, he was very proud of himself and wanted to help the peers that were struggling. He struggled in the first few activities, but after two months, his understanding of SASL increased and he enjoyed the activities.

The eight-week holiday break did not seem to cause any disruption in his skills development in general, except for his signing, which dropped to a level 2 in Activity 4 (which was a more challenging activity). In Activity 5, which focused on picture vocabulary, he was very unsure of himself and did not really want to be part of the activity. Therefore, his cognitive skills dropped to level 2 and signing to level 1. This can also be explained by the fact that he went home due to illness and could have missed his family. It almost seems as if he did not understand this activity and his concentration span was also very short, possibly because he was emotionally not ready for this type of activity.

In Activity 6, based on oral comprehension, he did not answer the question, but he kept explaining the pictures in front of him. He made up characters but did not answer the questions asked by the researcher. However, he suddenly managed to pull himself up as far as his signing skills were concerned and he reached level 3 again and even level 4 in the cognitive skills (Activity 7).

In conclusion, Ben's understanding, memory and cognitive skills fluctuated somewhere between level 2 and 4 over the seven activities. At first his understanding was very limited, but as his confidence grew, his language and understanding developed and he was eager to try more. He was

still a bit emotionally underdeveloped when looking at the unstable way in which he did his activities. This might show that he was not ready for certain types of activities. He also missed his home a lot since a term seemed too long for him. When looking at the graph in Figure 4.4, Ben seems like a constant, stable learner, who could experience hiccups every now and then. However, he will reach stability and steady development over longer periods of time.

4.4.5 John

Figure 4.5 shows John's performance in all seven activities, including the two drawing activities (Activity 2 and 3). 'Understanding' includes memory and cognitive skills as well as the drawings, since they include the cognitive development of the learners (Crosser, n.d).

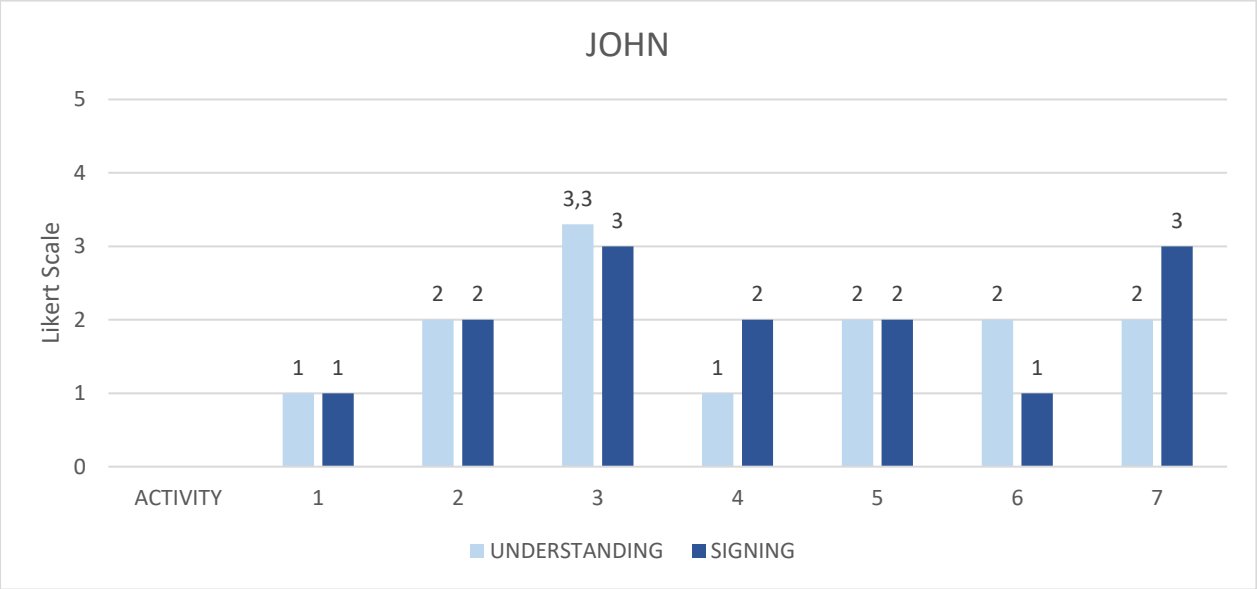


Figure 4.5 John

Similar to the other learners, John is the only deaf member in his family. He was six years old at the time the study started and also did not use any hearing aids. He was enrolled in the school for the first time in the year the research was done, 2016. He did not really sign at the time, but only copy-signed his peers. He struggled with simple sentences (e.g. *He eats*) in the first activity, but after a few months, he understood the signing better. However, he struggled with more complex sentences and questions. He did not know the core signs, for example WH-questions and he copy-signed everything that the researcher signed. When the class assistant helped him, he copied her signs and shared them with the researcher. Although he struggled, he copy-signed his peers in such a crafty way that the researcher was under the impression that those were his own answers. Because he was very unsure about himself and guessed most of the time, he would look at his peers and copy-signed when questions were asked. He would even copy the facial expression of the

researcher. The copy-signing might not be that good for him, because he was not learning anything from it and did not try on his own.

In Figure 4.5, it can be seen that over the seven activities, John's cognitive and signing skills fluctuated a lot and were very inconsistent, probably because of the time delay between activities. His understanding and signing/drawing improved in Activity 3 and the reason for this could be that he used his drawing to make him feel more comfortable with the conversation about the topic (story). He did not discuss his own drawings but was more interested in his peers' drawings. He was constantly seeking help from the class assistant.

Activity 4 was a much more challenging activity for him, especially in the cognitive part; therefore, it dropped to level 1. The level of his signing also dropped to level 2, probably because he did not get any exposure in SL at home during the holiday. The eight-week holiday was a huge interruption for him.

In Activity 5, with the reading vocabulary, he was not signing very well (level 2), although he still tried to answer on his own. He was still very unsure of himself, possibly because the other learners were older than he was and could have had more knowledge about signing than him. From Activity 5 onwards he stayed mostly on a level 2 as far as his cognitive skills were concerned. However, his signing skills were not that stable and dropped to a level 1 in Activity 6 and increased to level 3 in Activity 7. This could be an indication that he was unsure of what to do. Even though he could not remember the signs from the stories, he understood what was expected of him and made up his own story without using the pictures given.

In conclusion, John's progress was quite rapid in the first three activities, but in the last four activities he struggled to reach an average level (3). This could suggest that he struggled to manage both skills simultaneously. These activities were more challenging than the first three and he was very unsure about himself. However, Figure 4.5 shows that with more exposure to SL and cognitive stimulation over a longer period, he will be able to improve. With more confidence in his signing, he will be able to develop his cognitive skills and become a competent signer.

4.4.6 Sussie

Figure 4.6 shows Sussie's performance in all seven activities, including the two drawing activities (Activity 2 and 3). 'Understanding' includes memory and cognitive skills as well as the drawings, since they include the cognitive development of the learners (Crosser, n.d).

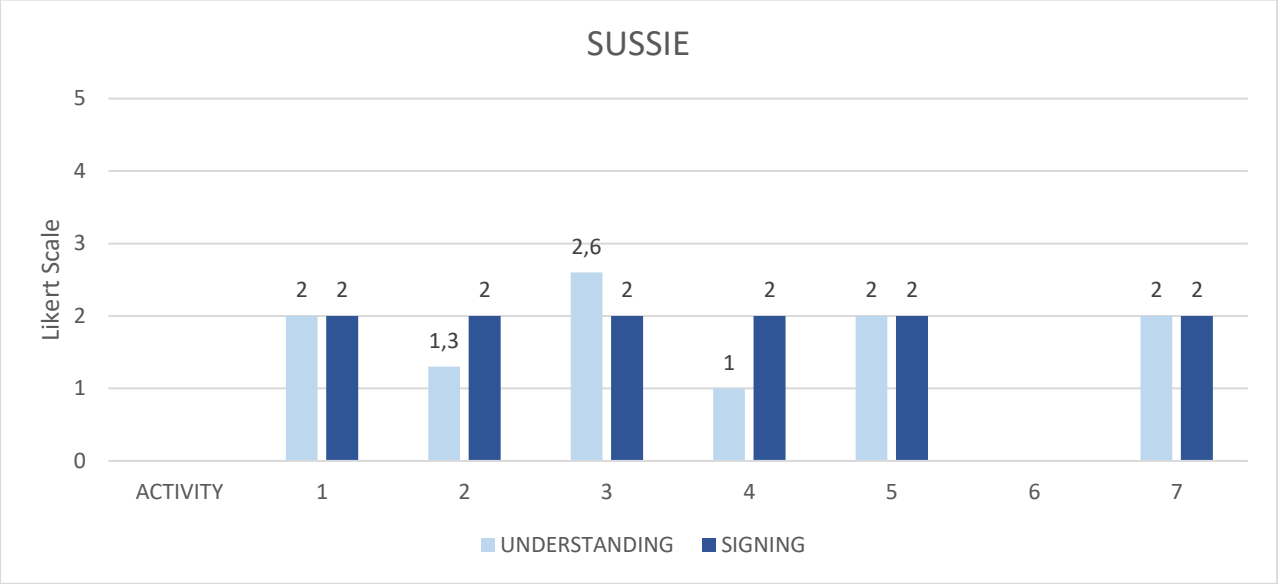


Figure 4.6 Sussie

Sussie is also the only deaf member in her family. She was five years old at the start of the study and did not use any hearing aids. She was enrolled in the school for the first time in 2016, the same year in which the research was done. In the early stages, she copy-signed her peers and was seeking their assistance. She used home signs and had very limited signing vocabulary. Surprisingly, the other learners understood her signs most of the time. They assisted her and explained the correct SASL signs to her so that she could sign to the researcher.

In Figure 4.6, it can be seen that over the seven activities, Sussie's signing skills were stable, but her cognitive skills fluctuated quite a bit. In Activity 1 and 2, she copy-signed what the researcher asked and one of her peers helped her with the answers. There was a slight improvement in Activity 2, because she remembered bits from the story and the copy-signing added the rest of the information. Her drawings in Activity 2 and 3 had no meaning, with only a scrabble of lines and circles (see Addendum 4C). She also had nothing to say about the drawing in Activity 2. She only pointed to the drawing in response to a question.

The improvement in her cognitive skills in Activity 3 could be because of the drawing (which was actually a scrabbled picture - see Addendum 4C), which formed a base for communication with the researcher and her peers. She signed bits of the story (*Phuti is born)* and although they were not all in the correct sequence, she was eager to tell the story.

Activity 4 seemed like an immense challenge for her and her cognitive skills dropped to a level 1. The reason for this might be the long holiday between activities, the same as for the other learners. Because this activity was on a higher cognitive level, it could have been too difficult for her. Nevertheless, the long break caused an interruption in her progress. She could remember limited information from the story (*Phuti is born*) but could only answer questions with her peers helping her. She really struggled with the letter-word identification, but she still tried to answer. The activity was very difficult for her, probably because she was still very young at the time. When she managed to get something correct in the picture vocabulary, she was very proud and then wanted to try more.

Both skills were on a level 2 in Activity 5, which could be an indication that she managed to use them simultaneously. There was no score for Activity 6, because she did not take part in this activity, possibly because she did not understand the activities. It could also be because she arrived late from home and still missed her family. She also copy-signed the questions of the researcher in Activity 7 and her peers assisted her with the answer. However, at the end of the research, she copy-signed less and tried to make up her own ideas and signs.

In conclusion, Sussie needs a lot of assistance and time to get her cognitive and signing skills on the same level as the other learners in the class. It must be taken into consideration that she was only five years old at the time of the research and had less exposure to SASL than the other participants. The inconsistencies in her results may be due to the time lapse between activities, which caused her to forget the signs and activities done in the previous sessions. A possible reason for her poor performance might be that either she was emotionally not ready to make up her own stories or she had forgotten the main point of the story.

4.4.7 Mapaseka

Figure 4.7 shows Mapaseka's performance in all seven activities, including the two drawing activities (Activity 2 and 3). 'Understanding' includes memory and cognitive skills as well as the drawings, since they include the cognitive development of the learners (Crosser, n.d).

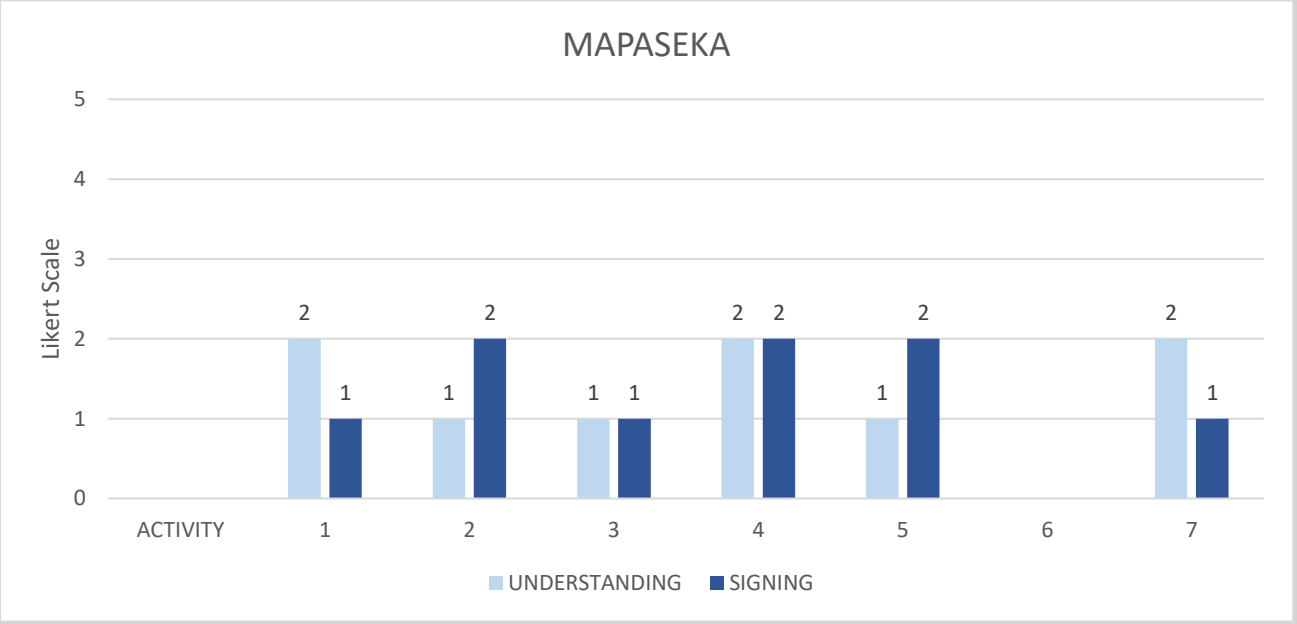


Figure 4.7 Mapaseka

Mapaseka, like the rest of her peers, is the only deaf member in her family. She was six years old at the time the study started and also did not use any hearing aids. She was enrolled in the school for the first time in the year the study was done, 2016. She entered the school late in the year and was behind the other learners who entered in March of the year. Due to this reason, she struggled with basic vocabulary in the beginning, for example, *toilet, sit* and *home*. She was "signing", but no one could understand what she was signing. She confused hand movements, gesturing, with real signing and was under the wrong impression that any movement had meaning and would be understood.

In Figure 4.7 it can be seen that over the seven activities, both Mapaseka's signing and cognitive skills were unstable and fluctuated quite a lot. Her emotions swayed and that could have had an influence on her schoolwork. The timespan between the activities might also be a reason why her results were inconsistent. She might have forgotten information between the different activities. The way the researcher conducted the activities differed from the way it was done by the teacher and that could have had an influence on her understanding of what was expected of her. She struggled to understand what she had to do and therefore her signing and understanding were inconsistent between activities. From seeing what the peers were doing, she tried on her own. Another reason might be that she forgot what they did in the previous activity and then struggled again to catch up.

She had very limited understanding in Activity 1 but improved in Activity 2 from level 1 to level 2 when the researcher was signing to the class. She copied the researcher and her peers' signing,

and just nodded her head if she was asked a question. Because she would ‘listen’ for a while and then looked away, her concentration span was also very short. This might have had an influence on her understanding and her not remembering what to do or what happened in the story (Activity 2).

As shown in the graph, her results were very unpredictable (Figure 4.7). In Activity 3 both skills were on level 1, but after the eight-week holiday both skills went up to level 2 in Activity 4, in spite of the higher cognitive level of this activity. Compared to her peers whose skill levels went down, this was quite an unexpected result, which again pointed to her unpredictability. One of her biggest challenges was the letter-word identification and when she succeeded to make an identification, she reacted with a lot of enthusiasm. It was as if a light was switched on in her brain. It was difficult to keep her quiet, because she was so eager to explain and share information with the other participants.

Her understanding in Activity 5 went back to level 1, while her signing stayed on level 2. There is no score for Activity 6, because she did not want to take part in the activity. It could be that she did not understand the instructions, or it could be that she just arrived back from a weekend at home without signing. This can also be seen in Activity 7 where her understanding was on level 2, while her signing was on level 1.

In conclusion, it can be said that Mapaseka needs much more intense and constant attention over a longer period of time to bring her on par with her peers. Both her understanding and signing skills were inconsistent and her performance was unpredictable. This might be one of the reasons why her activities were on a low level. The fluctuating scores for cognitive and signing skills show that she struggled to use the different skills concurrently. Because she was still very young at the time of the research, she still has time to catch up with the rest of her peers. This, however, will only happen if appropriate activities are done for language and cognitive development as well as activities to develop her signing and confidence.

4.5 Conclusion

In Figure 4, it can be seen that each of the learners’ signing and cognitive skills were more or less synchronised. Karabelo’s cognitive and signing skills were between average and good (3,7 and 3,9); Mpho’s skills were just below and above average (2,9 and 3,1); Silias’ skills were both between poor and average (2,6 and 2,3); Ben’s skills were below average (2,9 and 2,6); both of John’s skills were poor (1,9 and 2); Sussie’s skills were also poor (1,8 and 2) and Mapaseka’s skills were both between

poor and very poor (1,5). This means that there was some synchronisation between the two different skills and if the one skill improved, the other one would also improve. On the other hand, if the one skill were neglected, the other one would also be neglected. This is something that has to be taken into consideration when recommendations are made (in Chapter 5).

The results in Chapter 4 could be an indication that the more often and in-depth signing and cognitive activities the learners are involved in, without long interruptions between activities, the better their chances are for getting on par with their hearing peers or learners with a home language in place. The more learners are exposed to these types of activities, the better the chance will be for them to develop at the same pace and on the same cognitive levels as their hearing peers.

According to the results that can be seen in Figure 4, after the use of the *Woodcock-Johnson iii Test of Achievement* (Woodcock, Kevin, McGrew, & Nancy, 2001), a difference can be seen in the learners' signing skills and cognitive development. Learners showed an improvement between activities that were a week or two apart and a reason can be that they could remember the signs and what they did in the previous activity. As soon as there was an interruption or a long-time lapse between activities (e.g. a school holiday), they struggled with the activity and their levels dropped on the Likert scale. Recommendations in this regard will be made in Chapter 5.

Chapter 5: Conclusions and Recommendations

5.1 Introduction

The main aim of this study, i.e. the impact of underdeveloped language skills in the early stages of cognitive and language learning of deaf children, was discussed in Chapter 1. Chapter 2 gives a review of the literature, including a definition of SL, SL linguistics, language and cognitive development, language learning environment and Deaf Education. In Chapter 3, the research methodology was explained and in Chapter 4 the results were given and discussed. This chapter (5) deals mainly with how the study can benefit the stakeholders, such as the Department of Education, teachers, parents and, most of all, the learners. The main findings and recommendations will be summarised and will be given in this Chapter.

Several limitations were experienced in conducting this research. The first limitation is that the researcher did not have in depth information about deaf learners' parents or their home environment. The second limitation is that there is no existing standardised test for deaf learners' cognitive or language development and, therefore, the Woodcock-Johnson of Achievement WJIII-test (Woodcock, Kevin, McGrew, & Nancy, 2001) for hearing learners was adapted by the researcher for use in this study. A third limitation is the fact that the learners' attention span was very short. The learners really struggled to pay attention while the researcher was busy signing the stories and doing the activities although the researcher restricted the activities within more or less 30 minutes each.

Furthermore, the sessions took place during school hours and the researcher had to adhere to the school's schedule. This caused a problem because school or Departmental activities sometimes compromised the pre-arranged sessions. This caused time delays in some of the activities. The fourth limitation involved financial implications. The researcher had to travel 120km to and from the school for each session over a period of seven months. Therefore, the study was restricted to one school, one province and a limited number of available respondents from one ethnic group. These limitations resulted in a study where data from only one school was collected and this does not give a general account of deaf learners in a wider context.

5.2 Research Questions s and Hypothesis

This study tries to answer the questions that were asked at the start of this research in Chapter 1, namely, what is the impact of under-developed language skills on deaf learners in the early cognitive and language learning stages; whether it is not too late for a deaf child from hearing parents to

develop basic cognitive and language skills on the same level as his or her hearing peers? The purpose of the study is to find out whether it is still possible for a deaf child with a backlog in language and cognitive development to catch up and develop basic cognitive and language skills. According to Mayer (2007), early identification of learners with hearing loss allows for early intervention to take place when it comes to language development. Mayer (2007) said that deaf children's delay in one-on-one language contact and development could have a negative effect on their learning literacy. It can be seen in the study that the learners who had no or very limited one-on-one language opportunities with parents or other family members before they started school, struggled with general learning because they had to learn a new language to communicate in and a another one to enable them to read and write.

The hypothesis of this study can be accepted, namely, that it would be possible for a deaf learner with a backlog in language development to catch up with language and cognitive development and be on par with learners who grew up with their home language in place, provided that early and necessary intervention be applied. However, if early intervention does not take place, it will cause a delay in language and cognitive progress that can be detrimental in their academic development.

5.3 Conclusion

The deaf learners in the study entered the school where they were exposed to two new languages (SL and English), which are used as languages of teaching, learning and communication, for the first time. At the same time, they were exposed to new information (subjects) as contained in the school curriculum. Due to the lack of a home language, they also had a backlog in world knowledge. Deaf learners were therefore exposed to more than one learning activity simultaneously. All the learners involved in this study came to the school with no prior SASL knowledge and only acquired the new language when they entered the school. They had a definite backlog in language development when compared to their hearing peers.

The researcher observed that some of the learners had, in only a few months, acquired basic SASL to such an extent that communication between learners themselves and between learners and adults became a two-way process. Learners were eager to communicate with each other and adults on different topics, especially telling stories about each other and important things that they witnessed or experienced. Although conversations would at times not include all the information, it was enough for the listener to understand. Learners were eager to assist each other by adding to the story and correcting the signer.

From the results in Chapter 4, it can be concluded that definite improvement in the learners' language and cognitive development took place, although some of the learners, like Sussie and Mapaseka, might take longer to develop fully. Therefore, more effort from the learner and from the teaching staff is needed to ensure proper development.

As can be seen in Section 4.4 (Chapter 4), that the learners' language develops quickly if there are no barriers in the development process. If there are enough aspects conducive for language development, e.g. teachers who can sign, as well as deaf learners whose home/first language is in place, the possibility for learners to catch up with hearing learners exists. This will require a lot of effort and hard work from both teachers and parents, as well as a lot of motivation from them to keep the child going and wanting to improve. There was a definite improvement in confidence in some of the participants (e.g. Karabelo, Mpho and Ben) during the research. More reserved learners (e.g. John and Silias) used pointing at the start of the research, but managed to use only SASL to communicate towards the end of the research.

The researcher observed that learners like Karabelo and Mpho, who had attended school since the previous year, had more SL resources to communicate in comparison with other learners. They were also able to ask questions if they did not understand. Their SL skills equipped them to understand the content and instructions of the activities better when compared to the other learners. Three of the learners, Mapaseka, Sussie and John, had no previous SASL experience at the start of the research and they struggled with most of the activities. They were also not able to ask any questions at first. John improved faster in cognitive and signing skills than Mapaseka and Sussie, to such an extent that he wanted to communicate more with the researcher after a few sessions.

After completion of all the activities, a correlation between the different skills was visible - if one of the skills (signing) improved, the other skill (cognitive) also improved. This is an indication that the more their SL developed, the more at ease, they were with using SL to communicate and the better the chances were for these learners to make progress in their cognitive development. It is also evident that some were faster than others were. Similarly, learners who were slow in language skills were also slow in their cognitive development. Sussie is a good example of this. Her language skills were sometimes better than her cognitive skills and sometimes it was the other way around.

There are various factors that influenced learners' progress, for example, time lapses between activities affected some of the learners' performances in the activities. Except for Karabelo and Mapaseka, all the other learners' development was interrupted by the long break after Activity 3 and

they struggled to get back on track again. After the long break, their development was much slower. Another factor that had an impact on learners' improvement was copy-signing. Even though learners copy-signed the researcher, it was clear that their SL improved and their confidence grew when they had to answer a question or were asked something by the researcher. Learners' drawings can also be seen as a factor that influenced their progress in signing. These drawings served as support when learners had to give information about the story and also gave them confidence to communicate with their peers and the researcher.

A factor that cannot be ignored is the emotional readiness of learners. An example of this can be seen in the fluctuating Likert scale levels in the 'understanding' part of their activities. Some of the activities were on a higher cognitive level, for example, Activity 4. This was further complicated by the fact that this activity took place after the long holiday. These learners were very young at the time of the research and they missed their homes and families. Another aspect that can be taken into consideration, is the fact that there were sometimes significant differences between the Likert scale levels for cognitive (understanding) and signing skills in certain activities (e.g. Silias in Activity 5). This is an indication that learners struggled to manage two different skills simultaneously.

Although this study is based on one class, one school and one province only, it still has implications for Deaf Education as far as SL and cognitive development are concerned. Furthermore, it will create awareness among all the role players when it comes to Deaf Education, such as parents, teachers of the deaf, and the Departments of Education and Social Development. It is evident from the research that certain measures should be put in place for deaf learners/children to be exposed to SL at an earlier age so that their language development can be on par with that of their hearing peers. The following recommendations can be made to the various stake holders involved with Deaf learners and their education.

5.4 Recommendations

The first stakeholder that should become more involved with deaf children is the Department of Health. Clinics and hospitals need more people with the knowledge about different types of hearing loss. More qualified and informed clinic and hospital staff will ensure that signs of hearing loss are discovered early enough and that the child is not lost in the system. Furthermore, this will help to start their language and cognitive development at the appropriate age.

The second stakeholder that needs to be informed about the importance of deaf children is the Department of Social Development. More informed and knowledgeable staff in hospitals, clinics and

schools in the rural areas are needed which parents or family members can consult to help them make the right decision concerning the child's future. It is also essential that staff is trained to assist the parents in finding the right advice and school for the child. This will speed up the language and cognitive development process of the young child as well. There will be better results if the learners get more activities to help them to develop better cognitive and language skills. However, the learners must get much more support from people around them and much earlier, so that these activities can start as soon as possible.

Thirdly, the Department of Education is another important stakeholder involved with Deaf Education. More pre-primary schools are needed to cater for deaf learners or combined schools where deaf learners can attend from a young age to start learning their first language. Because there are no schools in the Free State that accept young deaf learners near their homes in the rural areas, to prepare them for school at six years old, parents often have to send their learners far away to a school for the Deaf. This is not an ideal situation and parents often do not want to do that. It is essential that the Department of Education should work together with universities so that prospective teachers study SL if they are interested in teaching at a special school or school for deaf learners. Pre-primary teachers especially, should be trained to help deaf learners learn a language in which they can communicate and be taught in. This will ensure that by the time they are ready for school, they can start learning and doing activities instead of only then starting to learn to communicate.

Fourthly, parents and family members need to learn SL to be able to fulfil their role as stakeholders in the child's education. It will be extremely beneficial if the family could all learn SL together before the child starts school. This will not only improve relationships amongst family members and the deaf child, but also assist the child in obtaining a language before he goes to school. This will put the child on par with hearing peers whose home language is in place. It will also create new opportunities for the child, such as, starting school at the proper age and developing a proper communication method with the parents and not just using "pointing" or gestures to communicate. It is important that parents know the language so that when a learner comes home for a weekend or holiday, the parents and family can communicate with the learners and the learners can share their stories from school with their families.

Last, but not least, are teachers and staff at schools for the Deaf. They need to be ready to assist deaf learners with SL. Therefore, it is of the utmost importance that teaching staff should be trained and equipped appropriately in SL to be able to facilitate learning in class. Schools could also provide

parents with training in SL so that good and proper communication can take place during holidays when the child is home.

5.5 Summary

In this chapter, the results were concluded and recommendations will be made to stakeholders who can help the Department of Education to focus on improving education in schools for the Deaf. Recommendations will also be suggested to the different departments so that they can assist parents and other family members when they discover that their child is deaf. Most importantly, the school, teachers and departments can use these results to improve Deaf Education to prevent late language acquisition so that deaf learners are on par with their hearing peers. The study has proved that early language development is essential in cognitive development. Therefore, if early SL learning intervention does not happen, the child will experience a backlog in cognitive skills and it will be not be beneficial in the academic development of the deaf child. This means that the deaf child will not progress beyond a certain point in their academic development and will be lost to higher education and training.

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Addendum 2A Sign Language Stages of Development.

American Sign Language stages of development. California School for the Deaf

3-12 months	Begins to notice signing. First sign may happen from 10 to 12 months. Babbles with hands. Imitates facial expression. Points to people and objects.
12-18 months	Use at least 10 signs. Begin to use pointing as pronouns. Acquires new signs.
18-24 months	Signs reflects basic handforms with simple movement up/down/forward and back. Early signs not always produce according to adult conventional form. Combines 2 or 3 signs, including pointing Begins to distinguish and use non-manual features
2-3 years	Sign order use to show semantic relations. Begins to use classifiers to represent objects. Attempt signs that are more complex but substitute the basic handforms for the complex handforms. Begins to use non-manual markers for yes/no questions and wh-questions. Demonstrate negation with shaking of head. Begins to use possessive, plurals, and pronouns. Refers to things around them during conversation.
3-4 years	Begins to mark distinctions between noun-verb pairs Use classifiers to show objects and give movement to them. Pointing to people and objects in the immediate environment. Tells stories through use of objects and role-play. Not always, clear who is doing what and where.
4-5 years	More complex handforms and movements. Begins to use noun modifications to show different meaning. Simple sentences used but sometimes a more complex sentence is used. Role-playing used more frequently with characters clearly identified.
5-6 years	Clear and consistent use of complex handforms and movement.

	Use fingerspelling more. Use complex sentences more Storytelling becomes more ‘adult like’ and make self-corrections Takes on a variety of roles during conversations and storytelling.

Adapted by the researcher (Education and Resources Center, n.d)

Addendum 3A Permission letter from Department of Education

Enquiries: BM Kitching
Tel. no: 051 404 9221 / 082 454 1519
E-mail: berthakitching@gmail.com

education
Department of Education
FREE STATE PROVINCE

Ms A Le Roux
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Dear Ms le Roux

APPROVAL TO EXTENT THE CONDUCTING OF RESEARCH IN THE FREE STATE DEPARTMENT OF EDUCATION

1. This letter serves as an acknowledgement of receipt of your request to extent the approval to conduct research in the Free State Department of Education.

   Research Topic: Cognitive development and the importance of language development.

   Schools involved: Bartimea school for the deaf and blind.

   Target Population: Foundation Phase Learners and Teachers.

2. **Period of research**: The fourth academic quarter 2015 with Grade R learners and teachers and from January to September 2016 with the learners and teachers in the Foundation Phase.

3. Should you fall behind your schedule to complete your research project in the approved period, you will need to apply for an extension.

4. The approval is subject to the following conditions:
   - 4.1 The collection of data should not interfere with the normal tuition time or teaching process.
   - 4.2 A bound copy of the research document should be submitted to the Free State Department of Education, Room 319, 3rd Floor, Old CNA Building, Charlotte Maxeke Street, Bloemfontein.
   - 4.3 You will be expected, on completion of your research study to make a presentation to the relevant stakeholders in the Department.
   - 4.4 The ethics documents must be adhered to in the discourse of your study in our department.

5. Please note that costs relating to all the conditions mentioned above are your own responsibility.

Yours sincerely

DR JEM SEKOLANYANE
CHIEF FINANCIAL OFFICER

DATE 02/11/2015

Addendum 3B Permission letter for school /consent letter to teachers

P.O. Box 22809
Exton Road
Bloemfontein
9301

26 November 2014

The Principal

Bartimea School

Dear Sir/Madam

RE: STUDIES: MASTERS IN DEAF LEARNERS LANGUAGE DEVELOPMENT

My name is Annemarie le Roux and I am a lecturer at the University of the Free State.
With this letter, I would like to ask for permission to come and do research for my Master's at Bartimea School for the Deaf and Blind. I want to do my Masters in Language development with the deaf children, focussing on the young children who had little or no language development at home.
I need to understand how their language develops at the school from day one.
My plan is to visit the school a few times and give worksheet to the learners in my study.
I would also like to do research of the teaching of the learners in the class and observe these activities.
I hope you find this in order.
Will you please complete and return, or send a letter with the relevant permission since I need to add the permission letter to my letter for the HOD.

Thank you for your help and assistance. I look forward to your favourable reply.

Sincerely

Annemarie le Roux

PERMISSION TO DO RESEARCH AT BARTIMEA SCHOOL FOR THE DEAF AND BLIND

I, _____THE PRINCIPAL OF BARTIMEA SCHOOL FOR THE DEAF AND BLIND, HEREBY GIVE ANNEMARIE LE ROUX PERMISSION TO DO HER RESEARCH , LANGUAGE DEVELOPING IN DEAF SCHOOLS, AT BARTIMEA SCHOOL FOR THE DEAF AND BLIND.

THANK YOU

_____

SEND TO:

Vanasa1@ufs.ac.za

Or fax to:

051 401 3511

Research at Bartimea School

Consent Form

PERMISSION TO BE A RESEARCH PARTICIPANT

I am a lecturer from the University of the Free State conducting research at Bartimea School, Grade R and Grade 1 for my Master's degree. I am a qualified primary school teacher with experience in working with Deaf children. As you are a Grade R teacher at Bartimea School for the Deaf in Thaba Nchu, you will automatically be involved in the research. To enable me to do the research you must *give consent to take part in the research project.*

1. **PURPOSE OF THE PROJECT**

   The purpose of the study is to become more aware of what is needed in the School for deaf learners and what the teachers and the Department of Education can do so that the learners can develop at the same level as hearing children.

2. **PROCEDURE AND INFORMATION**

   If you agree to partake in this project one following procedures will occur:

   - The researcher will visit the school once a week and do activities with the Learners during class time in the presence of the teacher.
   - Video recordings will be made of all the activities. Recordings will only be used to collect information for the research. The names of the children/teacher will not be revealed. Video recordings will not be made available for public viewing, although clips might be used during conference presentations.

3. **RISKS/DISCOMFORTS**

   It is not expected that the children/teacher will experience any risks or discomforts. Recordings will be done during class time in the presence of the Grade R or Grade 1 teacher in a normal teaching environment. Learners will not be exposed in any way to harmful or uncomfortable situations. However, participation is completely voluntary, and you are allowed to withdraw your child from the research at any stage.

4. **BENEFITS**

   By participating in this research project, learning from the teacher will contribute in advancing teaching and learning in Deaf Education. You might also benefit directly from the applied teaching and learning interventions during the research project.

5. COSTS AND PAYMENT

There will be no costs involved and you will receive no payment because of your participation in this study.

6. QUESTIONS

If you have any questions regarding the research project, you are welcome to contact the Department of South African Sign Language, University of the Free State, on the Bloemfontein campus (Telephone: 051-401 2251).

7. FEEDBACK OF FINDINGS

The findings of the research will be made available in various research reports.

If you are willing to participate, please read the information and tick the box with an X below

I hereby willingly give my permission to participate in the above mentioned study. ☐

I am aware that I am not forced in any way to participate and I understand that I can withdraw my at any time should I feel uncomfortable during the study. I also understand that my name not be made public. I also understand the benefit of participation and should I need more information the researcher is available to assist me.

_____

Date

_____

Name and surname

_____ _____

Signature **Witness**

Addendum 3C **Consent letter to parents**

P.O. Box 22809
Exton Road
Bloemfontein
9301

26 November 2015

THE PARENTS

Dear Madam/Sir

RE: STUDIES: MASTERS IN DEAF LEARNERS LANGUAGE DEVELOPMENT.

My name is Annemarie le Roux and I am a lecturer at the University of the Free State.
With this letter, I would like to ask for permission from you as the parent to use work that I do with your child for my research. No names will be used. I want to do my masters in language development with the deaf learners focussing on the new young learners who had no or little language development at home. The reason for this is that I need to see how their language develops from day one at the school.

I hope you find this in order.
Thank you for your help and assistance. Looking forward to your favourable reply.

Sincerely

Annemarie le Roux
Researcher

PERMISSION TO DO RESEARCH AT BARTIMEA

HEREBY I, _____ PARENT OF _____

GIVE PERMISSION TO ANNEMARIE LE ROUX TO DO HER RESEARCH, LANGUAGE DEVELOPING IN DEAF SCHOOLS, AT BARTIMEA SCHOOL FOR THE DEAF AND BLIND.

THANK YOU

_____

Addendum 3D **Ethical Clearance**

Faculty of the Humanities

21-Jun-2016

Dear Mrs Le Roux

Ethics Clearance: The impact of underdeveloped language skills on the early cognitive and language learning of deaf children: an empirical study at a school for deaf.

Principal Investigator: Mrs Annemarie Le Roux

Department: SASL (Bloemfontein Campus)

APPLICATION APPROVED

With reference to your application for ethical clearance with the Faculty of the Humanities. I am pleased to inform you on behalf of the Research Ethics Committee of the faculty that you have been granted ethical clearance for your research.

Your ethical clearance number, to be used in all correspondence is **UFS-HSD2016/0329**

This ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We request that any changes that may take place during the course of your research project be submitted to the ethics office to ensure we are kept up to date with your progress and any ethical implications that may arise.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours Sincerely

Prof. Robert Peacock
Chair: Research Ethics Committee Faculty of the Humanities

Addendum 4A WJ III ACH TEST Adapted by the Researcher to use for Deaf Children.

Activity	AREA	COGNITIVE PROCESS	RELATED EDUCATIONAL INTERVENTIONS	ACTIVITIES FOR THE LEARNERS
Activity 1	Story			The researcher signed a story to make sure the learners understood her SL.
Activity 2	Story recall	Construction of propositional representations and recoding.	Opportunities to visualise and practice language; direct instruction in semantics, syntax, and pragmatics; role-playing; games; compensatory skills; use of strategies (video, pictures, story books).	The researcher signed a story to the learners and they answered questions about the story. This happened after the story but also during the story. They drew a picture about the story.
Activity 3	Story recall delayed	Reconstructive memory after a time delay; content accuracy; preservation of discourse structure.	Active learning; rehearsal; overlearning; mnemonics; elaboration; visual representation (pictures, story books, videos, signing).	A signed DVD was shown to the learners and the researcher signed story to them. After a time-delay, they had to remember what happened and drew it in the correct sequence.
Activity 4	Picture vocabulary	Object recognition; lexical access and retrieval.	Creating a language - and experience-rich environment; frequent exposure to and practice with words; reading-signing to a child; text communication; semantic feature analysis; semantic maps; increased time spent reading-signing[17]; reading-signing for different	The researcher signed something and the learners had to pick the correct picture or finger spelled letter.

[17] Reading-signing: learners read what is signed to them and followed instructions so that the researcher could see that they understood.

			purposes; intentional, explicit word instruction; direct instruction in morphology; development of word consciousness.	
Activity 5	Letter- word identification	Feature detection and analysis (for letters) and recognition of visual word forms and/ or phonological access to production associated with visual word forms (i.e., words may or may not be familiar).	Explicit, systematic; synthetic signs instruction; word-recognition strategies (flash cards); repeated readings, teaching high-frequency words, spelling-based decoding strategies; Fernald method[18]. **http://en.wikipedia.org/wiki/Grace_Fernald**	Letter card/pictures were shown to the learners. They then had to give the correct SASL letter or sign.
Activity 6	Oral[19] comprehension	Construction of propositional representations through syntactic and semantic integration of orally presented passages in real time; inferential bridging (drawing conclusions).	Early exposure to language, particularly reading-signing to a child; direct instruction in vocabulary; directed vocabulary-building activities; outline of key points in teaching or oral instruction.	The learners had to look at the picture of a story in front of them and then decided on a story they could construct on their own about the picture. They looked at the picture and said what would happen next.
Activity 7	(visual) Reading Vocabulary	Recognition of visual word forms; lexical activation and semantic access; semantic matching and verbal analogical reasoning.	Semantic feature analysis; semantic maps; text communication; directed vocabulary-building activities; increased time spent reading; reading for different purposes; intentional explicit word instruction, independent word-	There were pictures put in front of the learners. They had look at the different pictures and put the correct ones together e.g., picture of Didi and a girl.

[18] The Fernald method have 4 stages to help with the progress of the learners reading and writing.
[19] Oral comprehension: this was in SASL and not in a spoken language, but was still be seen as oral feedback because the learners had to give feedback through their language.

			learning strategies, development of word consciousness.	

Adapted from Woodcock, Kevein, McGrew and Nancy (2001)

Adaptations made from the original WJ III ACH Test

The original WJ III Test had six tests or activities while the adapted test had seven activities. The reason for added activity was that the researcher had to establish rapport with the learners and wanted to make sure that the learners understood her.

In the original test, the letter-word identification test has been done first and in the adaptation, it was done in activity 5, because it was too advanced for the cognitive level of the participants at that stage. Other adaptations that were made are as follows: words like “hear”, “speak”, “read aloud”, “talk”, “orally presented”, “oral instruction” were replaced by “look”, or “sign”. The “visual representation” in the original was replaced by the drawing of pictures; phonics instruction was replaced by fingerspelling games and instruction. The computerised programme exercises were omitted b because the participants were not familiar with computers and had no access to them.

Addendum 4B

Rubric for Assessment of SL Expressive Skill

	Very Poor (1)	Poor (2)	Average (3)	Good (4)	Very Good (5)
Formation: Parameters	Frequently use of incorrect signs. Very difficult to understand the signing.	Incorrect use of signs. Difficult to understand signing	Some errors, but signing is understandable. Errors are not corrected	Self-corrects a few of the mistakes. Easy to understand	Consistent use of correct signs. Clear, easy to understand
Space referents: Motion/location of verbs –eye gaze and body shifting	Struggle with placement. Do not keep eye contact.	Struggle with setting up points in space for people and objects. Struggle to keep eye contact. Lack expressive behaviours when they sign.	Limited use of placements. Limited use of eye contact. Limited expressive behaviour when signing	Frequently use placement for people and objects Maintain some eye contact. Some expressive behaviour.	Extensive use of setting up point to refer to objects and people. Good eye contact. Enthusiastic when signing.
Grammar: Yes/no questions Wh-questions Negations Contrastive structure	No facial expression when signing. Difficulty using intensifiers.	Lack facial expression when signing. Struggle to use intensifiers.	Some appropriate use of facial expression. Inconsistent use of intensifiers.	Appropriate use of facial expression. Some Inconsistent use of intensifiers.	Use good facial expression when signing. Use intensifiers.
Fluency/ Accuracy: Smoothness and fluency of signs Accurate message	Communicate with fluency and confidence. sign conceptually accurate ideas/messages consistently.	Smooth flow of signs with confidence sign conceptually accurate ideas/messages most of the time.	Hesitates and self-correct when signing sign conceptually accurate ideas/messages on a limited basis.	Unable to sign conceptually accurate ideas/messages. Sloppy movement and signs.	Unable to sign conceptually accurate ideas/messages.

Adapted from California School for the Deaf (n.d)

Addendum 4C

Rubric for Assessment of SL Receptive Skills

	Very Poor (1)	Poor (2)	verage (3)	Good (4)	Very Good (5)
Basic vocabulary	Very limited understanding of signs. Needs frequent repetition of signed vocabulary.	Limited understanding of signs. Requires repeat of signs.	Limited understanding of sign. Require some repeats of signs.	Understand most signs. Rarely ask for repeating of signs.	Understand all signs. Do not need any repeating of signs.
Fingerspelling	Very limited understanding of fingerspelling words. Requires frequent repeat of fingerspelling words.	Limited understanding of fingerspelling words. Requires repeat of fingerspelling words.	Limited understanding of fingerspelling words. Requires some repeat of fingerspelling words.	Understand most fingerspelling words. Rarely requires repeat of fingerspelling words.	Understand all fingerspelling words Do not need repeating of words.
Simple sentences and questions	Very limited understanding of simple sentence or questions.	Limited understanding of simple sentence or questions. Requires repeat of sentences.	Limited understanding of simple sentence or questions. Requires repeat of sentences.	Understand most simple sentences and questions. Need some repeating of sentences.	Understand all simple sentences and questions. Do not need any repeating of sentences or questions.
Complex sentences and questions	Very limited understanding of complex sentence or questions.	Limited understanding of complex sentence or questions Requires frequent repeat of the sentences and questions.	Limited understanding of complex sentence or questions. Requires repeat of the sentences and questions.	Understand most complex sentences and questions. Requires some repeat of the sentences and questions.	Understand all complex sentences and questions. Requires no repeat of sentences or questions.
Non-manual markers	Very limited understanding of	Limited understanding of non-manual markers.	Limited understanding of non-manual markers.	Understand most of non-manual markers.	Understand non-manual markers.

	non-manual markers. Response inappropriately to non-manual.	Apply limited non-manual markers.	Apply some non-manual markers.	Respond appropriately to most non-manual behaviours.	Respond appropriately to non-manual behaviours.

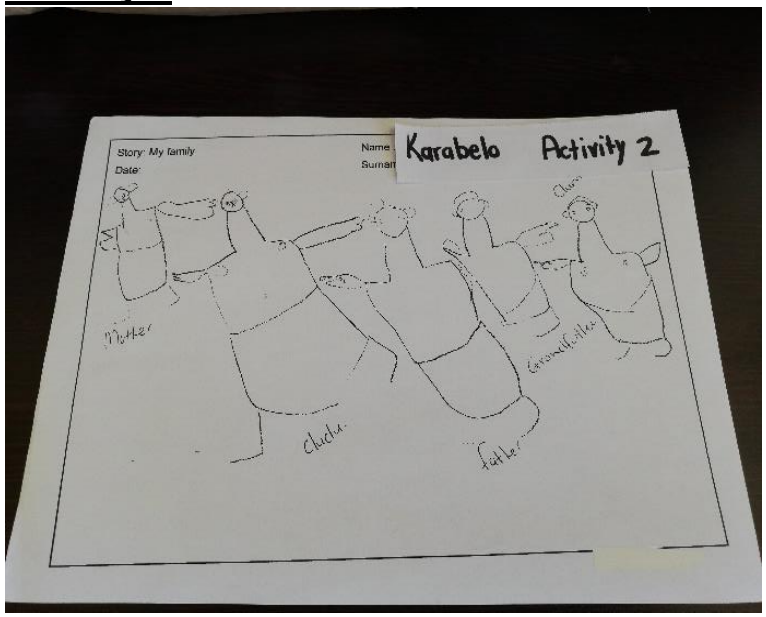
Adapted from California School for the Deaf (n.d)

Addendum 4D

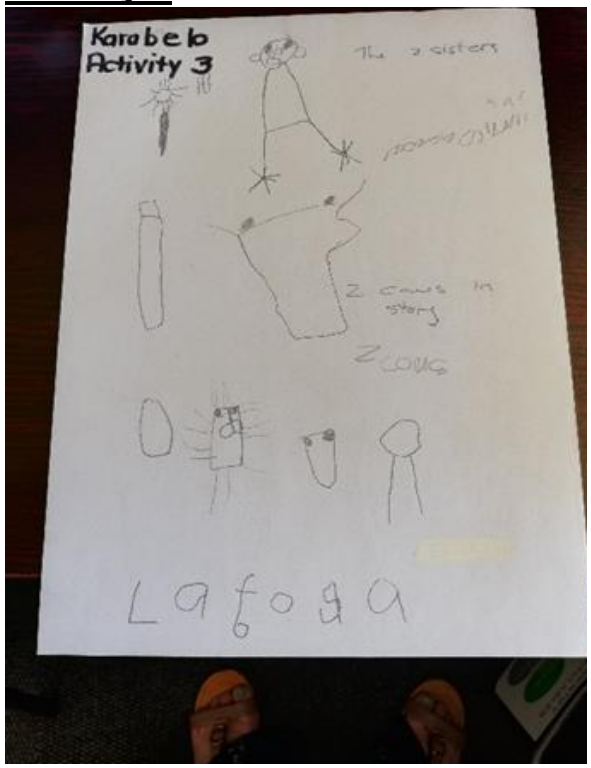
Drawings of Activity 2 and Activity 3

Karabelo

Activity 2

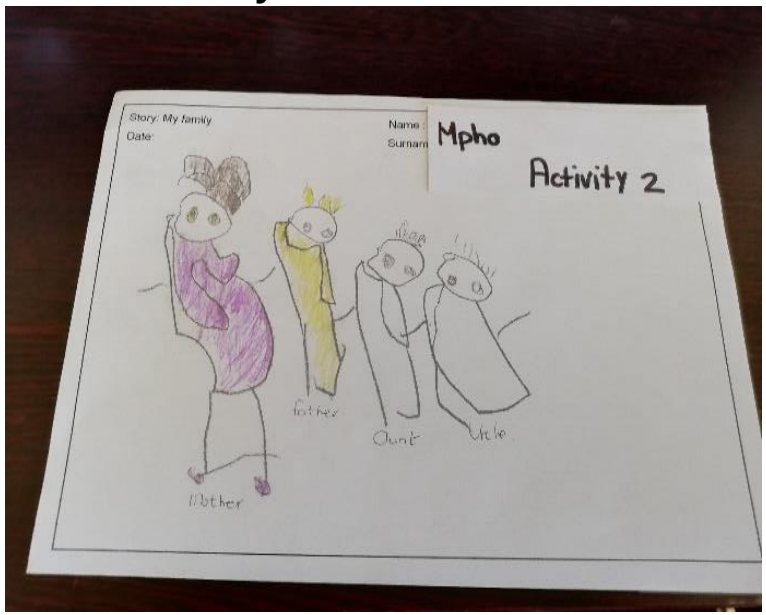


Activity 3



Mpho

Activity 2



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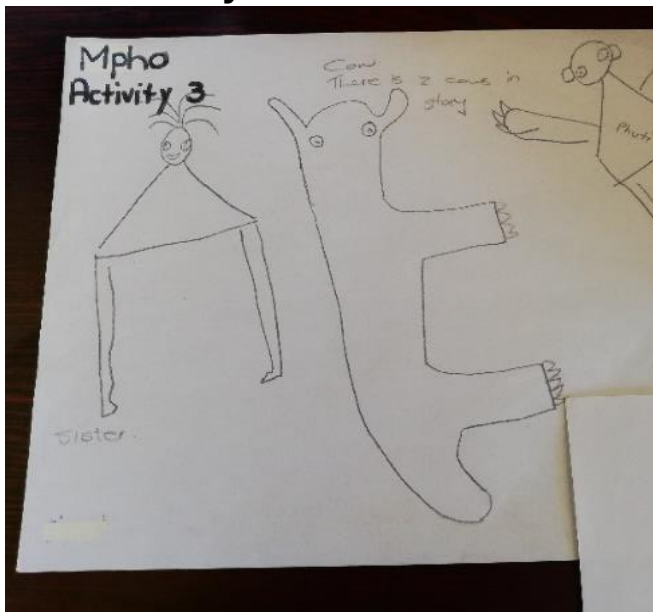
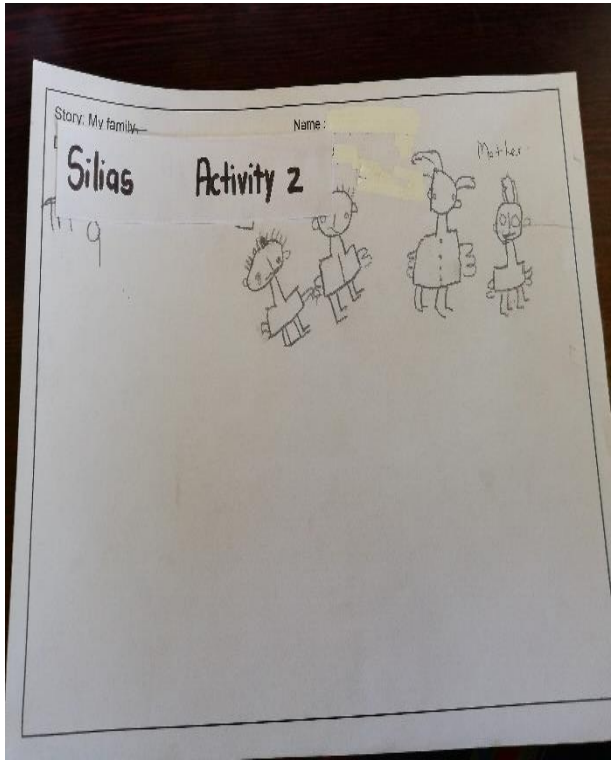
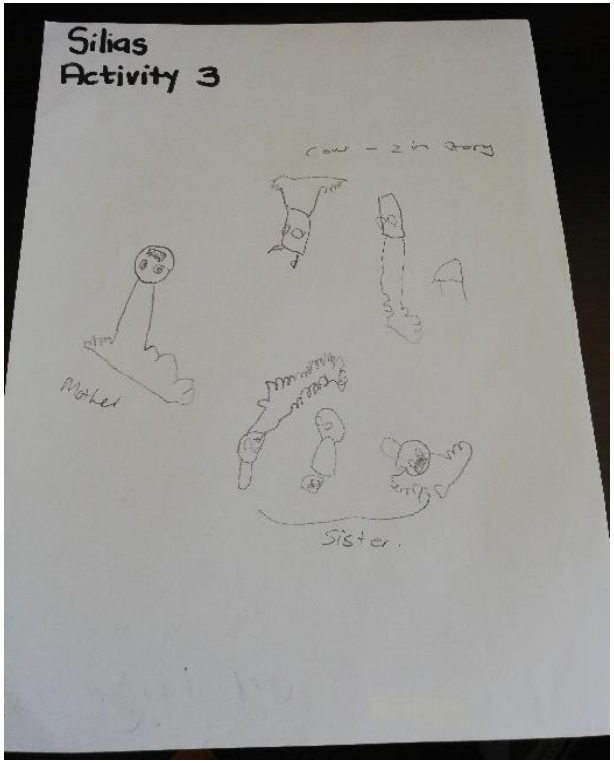


Activity 2

Activity 3

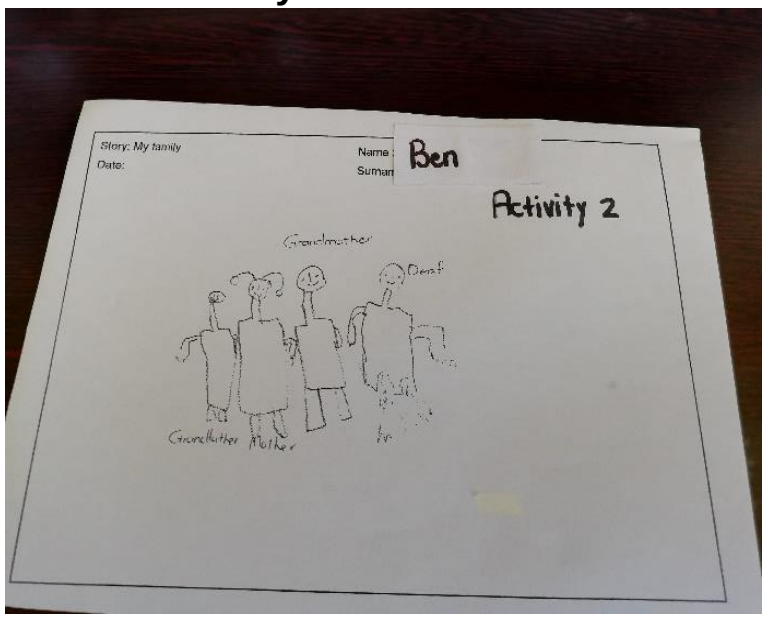
Silias





Ben

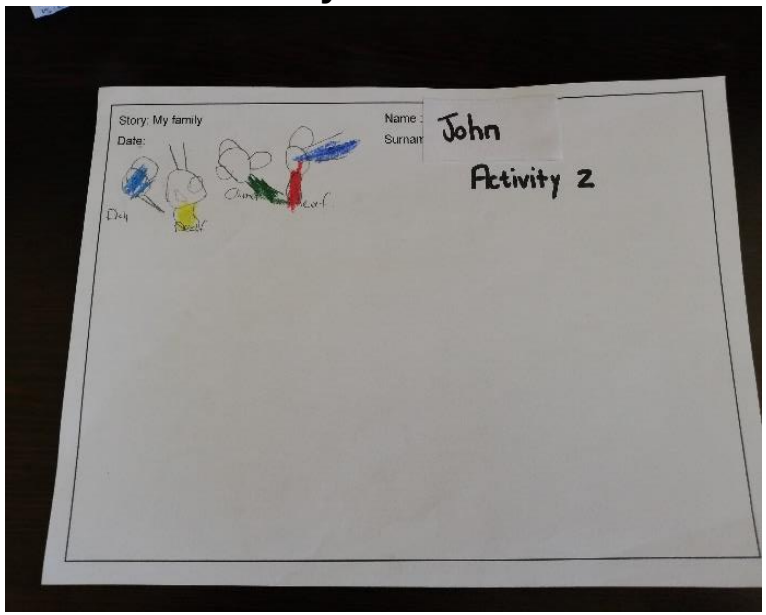
Activity 2



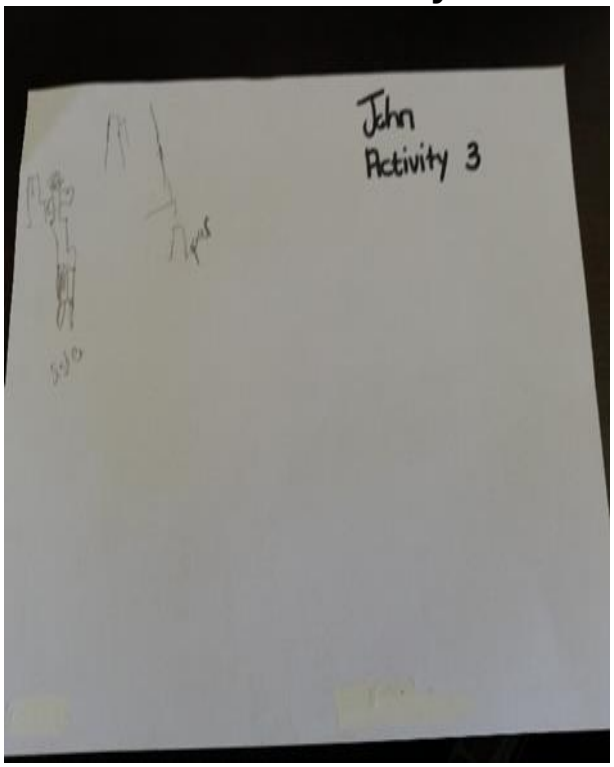
Activity 3

John

Activity 2

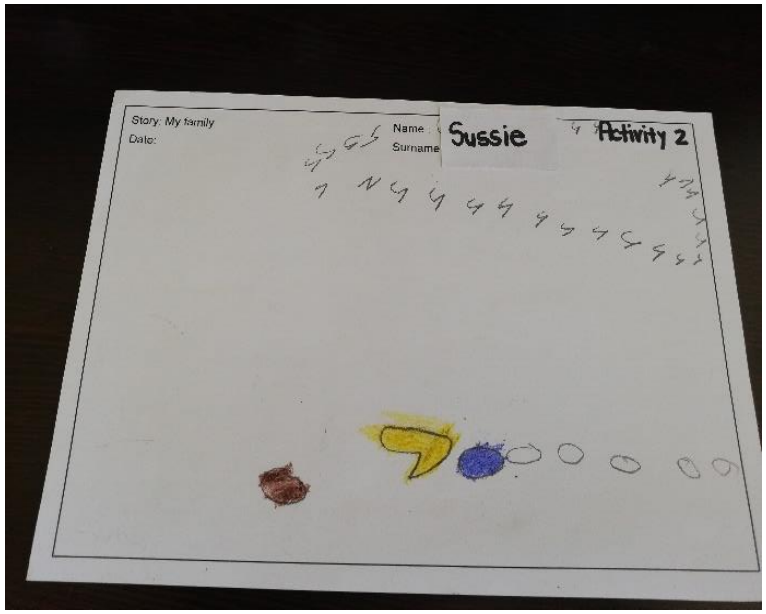


Activity 3

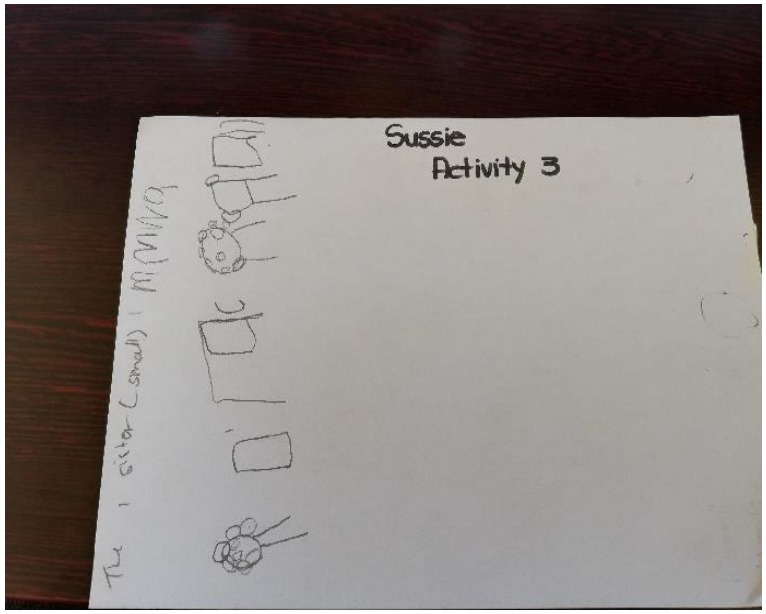


Sussie

Activity 2

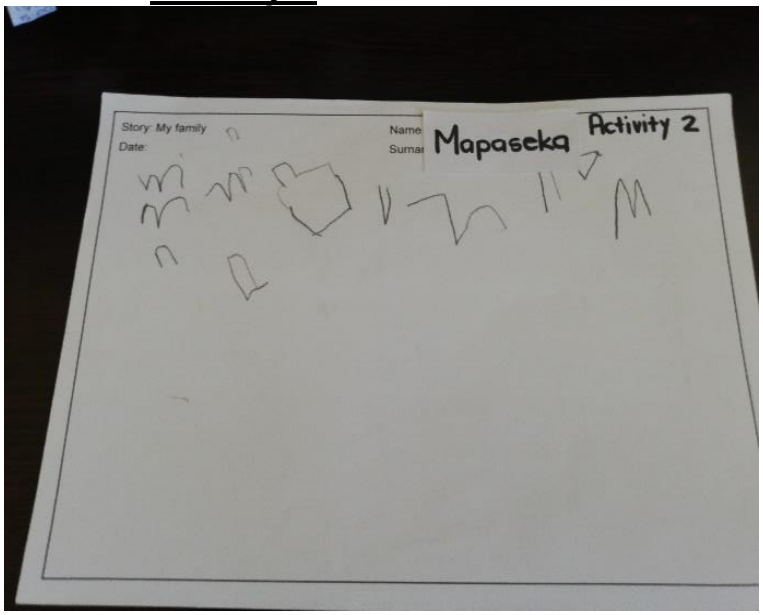


Activity 3

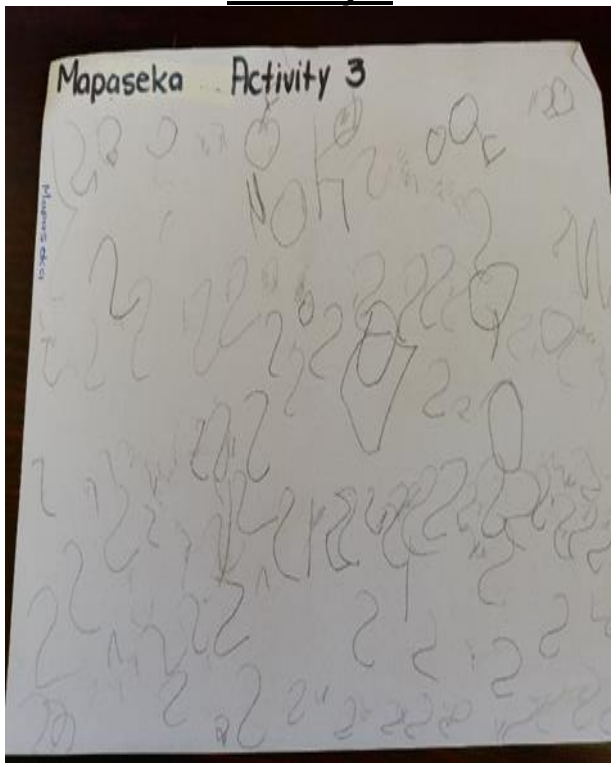


Mapaseka

Activity 2



Activity 3

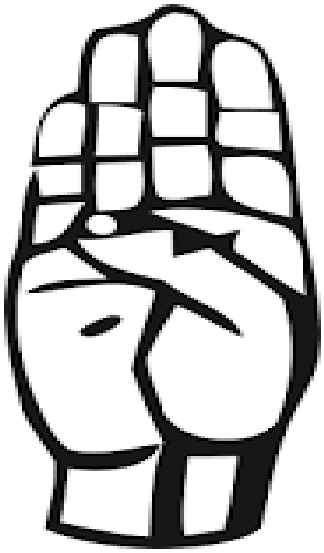


1a

1b

CAT

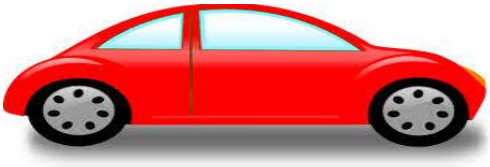
2a



2b

- Number 1a is a card with the C-handshape and 1b is a card with the English word CAT and the picture cat.
- Number 2b is a card with the B-handshape and 2b is a card with the sign for HALLO.

1a

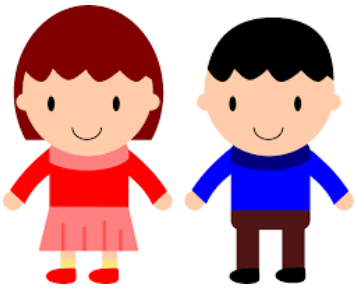


1b
Where is the car going?

2a

2b
What do we do here?

3a



3b
Who is this and where are they going?

- Number 1a is a card with a red car that was put in front of the learners and in 1b the question that was asked to make the learners discuss what is in front of them.
- Number 2a is a card of a church building that was put in front of the learners and 2b the question that was asked to the learners to help them discuss the picture in front of them.
- Number 3a is a card with boy and a girl and 3b is the question that was asked to the learners to help them discuss the picture in front of them.

Addendum 4G

Activity 6

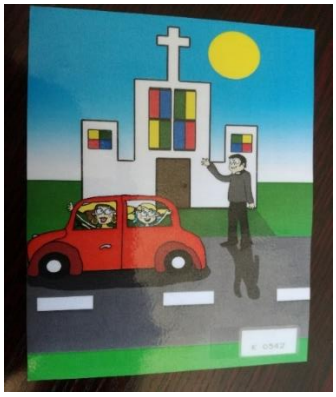
Number 1a is a card with a red car and 1b is a card with red car from the story (see Activity 1) filling up with petrol.

1a

1b

2a

2b



3a

3b

Number 2a is a card with a church and 2b a card with the church and pastor from the story (see Activity 1).

Number 3a is a card with girl and 3b is a card with Didi, the girl from the story (see Activity 1).

Addendum 4H

Activity 7

1a

1b

Sign GIRL

2a

2b

Sign CAR

3a

3b

Sign CAT

All the pictures were put in front of the researcher and then the researcher would sign e.g. CAT and the learners had to pick the correct picture from all the pictures on the floor in front of them.