CHAPTER ONE:
INTRODUCTION

1.0 Background to the Study

The 1989 Convention on the Rights of the Child (CRC), the instrument in international law to deal with the rights of children, consists of 42 detailed provisions protecting the rights of children in all areas of their lives. Two of the provisions are related to disability, which is Article 2 that expressly prohibits any discrimination in respect of CRC’s resolution on the grounds of disability. The second is Article 23, which has specific details on the rights of children with disabilities, (reproduced as Appendix 4). Article 23 emphasizes that “a disabled child has the right to special care, education and training to help him/her enjoy a full and decent life in dignity and achieve the greatest degree of self-reliance and social integration possible”. As such, the special needs of Deaf children need to be identified so that they will be able to enjoy opportunities to develop through good education and training. More importantly, it is to enable them to be independent members of the society that they live in.

It is often a struggle for Deaf people to fit in with the Hearing world where spoken languages are commonly used, which do not benefit most of the Deaf people who do not have hearing nor speaking abilities. The most significant drawback is the lack of ability to properly utilise spoken languages, as such communication with the rest of the people are often difficult or limited. This struggle has led to the creation of a new culture so that they can co-exist in the Hearing world; hence the culture, which came to be known as the Deaf Culture. The term “Deaf Culture” is the social movement that holds deafness to be a different human experience rather than a disability (Ladd, 2003). The
“Deaf” with upper case “D” is distinguished from “deaf” with the lower case “d” by their meaning within the Deaf Community consisting of Deaf people, sign language interpreters, and those people working with Deaf people. “Deaf” symbolizes the identity of the people who lost their hearing ability and use sign language as a main medium of communication while “deaf” is referred to lacking a sense of hearing or refusing to listen. Like many children all around the world today, Deaf children grow up learning two languages (a spoken language and a sign language) sometimes in different cultural settings (Christensen, 2000). However, the way Deaf people learn languages is different from other disabled or non-disabled people. Many Deaf children acquire their language and culture from their deaf peers and deaf adults at school instead of from parents and relatives with the exception of Deaf parents, (Plann 2000). In such situations, the dissemination of Deaf people’s language seems to be occurring almost exclusively within the Deaf community, at schools for the Deaf and Deaf associations where sign language is practiced/used.

Many Deaf parents rely on the belief that their Deaf children would be able to adapt to any environment without the need for proper early intervention education. In reality, this is not the case, as pointed out earlier. Deaf Culture exists because of the struggle the Deaf people have experienced in the Hearing world. The world is not “amicable” enough to the Deaf people; hence, Deaf people face many challenges and difficulties. When it comes to language learning, the Deaf children are usually left out and are helpless without proper guidance from adults. Therefore, it is appropriate that Deaf children receive adult assistance, especially from their parents in acquiring both sign and spoken languages, which can be done through early intervention education. It is the contention of this study that, all children whether deaf or hearing, need to receive
sufficient and relevant language input as early as possible so that they will be sufficiently competent in at least one language by the time they reach school age.

Mastering a language can be more challenging for Deaf children than for hearing children. Hearing children are able to pick up languages from their environment easily but for the Deaf children, there are limitations, as they cannot hear the input and they have to depend totally on their sight to acquire language. Therefore, Deaf Children need to be put in an environment where they can get plenty of visual input and opportunities to practice as much as possible to assist their acquisition or learning of the visual language – at an early age – and this sadly may not be provided for in the home environment. That is why, it is important that parents of Deaf children are made aware of the positive impact early language intervention programmes or activities can have on their Deaf children’s academic development and success.

According to Krashen’s (1985) Input Hypothesis, humans acquire language by understanding messages, or by receiving “comprehensible input”. Children typically recognize and understand the sounds they perceive. Based on the imitation and reinforcement theories of children’s acquisition of language, children will receive language input in terms of sounds and will attempt to produce these same sounds. With these attempts, the adults hear the produced sounds and will correct the children or reinforce their utterances by reproducing the sounds accordingly. These theories also apply to the Deaf children but through a different medium; the children will imitate the sign language used by their parents when they are engaging in conversations. Deaf children receive less linguistic information due to their inability to hear all the speech directed at them (Dockrell & Messer, 1999). In elaboration to that, the environment where the Deaf children live might lack both sign language exposure and constant
assistance from their parents in acquiring sufficient information from their surroundings. Moreover, Bailes (2001) states that Deaf children who are afforded “opportunities” to acquire sign language naturally at an early age, are therefore made aware that spoken language is the language using speech, and they should be able to acquire parallel competence in both languages with success.

1.1 Problem Statement

There have been many studies that provide evidence for language acquisition occurring naturally in hearing children (Baron, 1992; Hoff, 2009; Owens, 2008; Ng & Wigglesworth, 2007). Ahlgren (1994) suggests that sign language can be developed as the first language if Deaf children can spend sufficient time with Deaf adults or Hearing parents who know sign language. Sign language is a minority language which can only be seen when Deaf people mingle/communicate. Deaf parents are considered to be capable of using sign language as sign language is the language they use to convey messages and feelings to other people. For the same reason, Deaf children are able to acquire sign language naturally from their parents before he/she gets exposed to a wider circle of other sign language users. Based on the findings of studies by Bailes, 2001; Taub & Galvan, 2001 and Ramsey & Noriega, 2001, it is the contention of this studies that Deaf children, just as Krashen’s Input Hypothesis suggests that children, need sufficient input in order to achieve high competency in language. It may also be the contention of this study as the Deaf children may not be able to acquire sign language completely without sufficient visual language input.
1.2 Aims and Objectives of the Study

This study aims to investigate the effect of input on the acquisition of sign language among Deaf children with Deaf parents. The investigation into the effect of input on sign language acquisition will involve comparing and describing the development of Sign Language in Deaf children from two different linguistic environments. One is an environment where the child is exposed to a lot of sign language input on a daily basis, and the other is an environment where sign language input is limited. The specific objectives of this study are:

1. To describe the expressive and receptive skills of Deaf children based on facilitated sign language learning activities.
2. To determine the more conducive of the two environments for sign language acquisition to occur.
3. To investigate whether Deaf children need early language intervention

1.3 Research Questions

To facilitate the investigation, the following research questions have been formulated based on the research objectives identified above:

1. What is the level of expressive and receptive sign language mastery presented by the four Deaf subjects?
2. To what extent does the amount of input and practice within their individual linguistic environment influence the respective children’s level of mastery in sign language?
1.4 Significance of the Study

The findings of this study will be a valuable guidance for educators and medical staff, specializing in children cognitive development in advising Deaf and Hearing parents who have deaf children, in terms of the kind of language learning/acquisition environment they need to provide for their children in order to enhance their competency in sign language. It also sets the platform for further research on sign language acquisition among Deaf children.

1.5 Scope and Limitation

As it is difficult to find a suitable sample, this study is limited to using a case study approach based on only four Deaf children. The children are learning language in different environment settings based on their parents’ decisions, which in turn is influenced by their individual circumstances as well as the Deaf culture that they have adopted due to their Deafness. The study is limited to describing the respondents’ expressive and receptive skills based on a set of facilitated activities. There will be interview sessions with the parents and caregivers, however, the full details might not be obtained as time constraint does not allow for a longitudinal investigation which could reveal a more comprehensive description of the language acquisition processes in the four children.
1.6 Summary

This chapter outlines the background and specific research questions that set the parameters of this study. The researcher also highlights the importance of the study as it will carry possibilities for the Deaf children in acquiring sign language well.

The following chapter will focus on the introduction of the sign language, children’s language development, parenting children with disabilities and children with/using sign language. This chapter mainly focuses on the language acquisition by Deaf children.
CHAPTER 2:
LITERATURE REVIEW

2.0 Introduction

Language is defined as a systematic arrangement of arbitrary symbols that have generalized meaning (Gonzalez-Mena & Eyer, 2009). Human language is, first and foremost, a social instrument that greatly affects each person’s way of being in the world and living in society (Jalongo, 2000). Also, language itself is conveyed through a variety of modes (Owens, 1996, as cited in Beattie, 2001). Thus, the language Deaf people use is a language of arbitrary symbols which are conveyed through sight and hand movements. Local Sign Language is referred to the Sign Language used in Malaysia. This Sign Language has existed for more than 50 years in Malaysia. According to Malaysian Federation of the Deaf (2000), the sign language started from the Federal School for the Deaf, Penang in 1954. Many Deaf students went to the school; therefore, the sign language was then brought back to their home state. The Sign Language which is known as Bahasa Isyarat Malaysia (BIM) or Malaysian Sign Language (MySL) started with gestures and facial expressions used amongst and understood by Deaf people. These gestures and facial expressions gradually developed into simple signs to convey messages, which eventually became a collection of signs (Malaysian Federation of the Deaf (MFD), 2000).
2.1 Sign Language

All languages are natural, whether spoken or signed, they represent and convey the same concept (PribaniKj & Milkovikj, 2009). Sign Language is considered a true language, like any other language although its usage is different, requiring the eyes to receive messages and hands to express these messages. Sign Languages have their own linguistic genetic histories and everyone within the community uses Sign Language as a symbol of their own individual identity (PribankiKj & Milkovikj, 2009).

The Federal School for the Deaf (FSD) was founded by Lady E.M. Templer to provide special education to Deaf children who were previously mistreated. The school started with seven students who were barred from using signs but the oral method instead in their classroom for communication purposes (Saleena, 2004). However, the students had developed Sign Language among themselves by signing at night in their dormitory. In 1976, Total Communication which includes oralism, lip-reading, manually coded Malay Language and English (known as BMKT and SEE respectively) was introduced in public schools for the Deaf. The BMKT and signs which were used in the FSD gradually evolved into the local Sign Language which is now known as Bahasa Isyarat Malaysia (BIM) or Malaysian Sign Language, a language Deaf people use for communication purposes.

Even though the local Sign Language can be categorised into the same group of other spoken languages, the local Sign Language has not been publically recognized in Malaysia. In addition to that, there is an assumption that the vocabulary of Sign Language is literally a translation from Bahasa Malaysia or English words. Stokoe (2001) who has observed and studied American Sign Language extensively has similar
feedback in his research. The research methods which linguists have used in spoken languages have been applied to Sign Languages and the results confirmed that the vocabulary of Sign Language cannot be translated literally from a spoken language based on its grammatical context (Stokoe, 2001).

### 2.1.1 The Grammar and Syntax of Sign Language

Stokoe (2001) stated that Sign Language has its own meaning, just as other (spoken) languages do. Spoken languages, for example Bahasa Melayu (BM) and English (BI) have phrases and sentence structures different from the local Sign Language. Stokoe (2001) also suggested that Sign Language has its own elements which are place, classifier, handshape, body and hand movements. Schornstein (2005) suggested that Hearing or Deaf people (with strong command in any spoken languages) who want to use sign language to communicate with their Deaf friends will have to put their spoken language aside. This way will enable them to be able to “see” the Deaf language and they will be able to visualise and understand the language conceptually, as in Figure 2.1, which has been suggested by Chong and Ho (2010). Spoken languages are limited to vocals and consonants when describing a scenario while Sign Languages can describe the same scenario in an easier and clearer manner over a shorter duration.

**Figure 2.1:** BIM structure 1
Figure 2.1 shows a sentence using BIM structure, which can be translated into “Let’s discuss the plan for today” in BI and “Mari kita berbincang tentang rancangan hari ini.”. If each of sign vocabularies is translated into BM or BI, it would not make any sense to that person. That person might think that it is “Shall we discuss the plan today?” instead of “Shall we discuss today’s plan?”. Figure 2.1 suggests a normal sentence to call for a meeting, instead of making request or demand. Therefore, the BIM structure has to be “read” without referring to BM, BI or any spoken languages.

Stokoe (2001) provided evidence that Sign Language has its own grammar which is based on its own set of rules and vocabulary that are different from those for Bahasa Melayu and English. When we are signing a language, it might seem that we are using sentence structures from Bahasa Melayu and English with the typical subject + verb + object structure. This kind of grammar is universal. Many Deaf Sign Language signers use similar structure from Bahasa Melayu and English to convey their ideas, as in Figure 2.2, which was suggested by Chong and Ho (2010). Therefore, it is always misunderstood that BIM can be signed or expressed literally to BM or BI structure. However, if every word in BM or BI structure is translated into each single sign, it is called as a signed language and it is not a true language, which was mentioned by Stokoe (2001). However, when Sign Language signers use sentences with complex structure, it becomes clearer to the observer that the structure is different from any spoken language, as in Figure 2.3 and Figure 2.4.
**Figure 2.2:** BIM structure 2

![Image of sign language gestures]

TEACH PERSON SORRY LATE

Source: Chong and Ho (2001)

Figure 2.2 shows a sentence using BIM structure. (Translation in BI: “Teacher, I am sorry for being late.” and in BM: “Cikgu, saya minta maaf kerana terlewat.”). BIM sentence structure shown is almost similar to the translation in BM and BI. The BIM sentence structure does not need to include pronoun (“I”/“saya”) because the pronoun is the signer herself and conjunction (“for”/“sebab”) because it was very clear that she was late.

**Figure 2.3:** BIM structure 3

![Image of sign language gestures]

YOU WORK WHAT

Source: Chong and Ho (2001)

Figure 2.3 shows a sentence using BIM structure for “What do you do?” in BI and “Apa pekerjaan anda?” in BM. The WH-question “WHAT” is put at the end of the sentence in BIM, however, it is in the first place in BI and BM. The sentence in BIM starts with second party pronoun, to seek attention and initiate or continue carrying conversation.
Figure 2.4: BIM structure 4

![BIM structure 4]

CLOTHES DISCOUNT CHEAP WHEN

Source: Chong and Ho (2001)

Figure 2.4 shows a sentence using BIM structure, which can be translated into “When is the grand sale?” in BI and “Bilakah jualan murah akan diadakan?”. The sign vocabularies CLOTHES and DISCOUNT do not exist in the translations. If these sign vocabularies are translated directly, translation in BM and BI would not be meaningful.

There are some assumptions within the Deaf and Hearing people that the local Sign Language has been invented based on a spoken language in order to ease communication. The perception that Sign Language is the abbreviated or the shortened version of spoken languages is a gross misinterpretation by local people. This is not proven and no research has been carried out to show such an assumptions. Yet, it was noticed that many Deaf people, especially those who grew up using sign language, use correct grammar when constructing sign vocabularies to make sentences without realizing that they are actually capable of doing so. They were never taught how to construct the BIM structure as there was no formal education on BIM for the Deaf youngsters. However, the wrong assumptions have created an obstacle for BIM to develop and advance to be equal to BM and BI status in Malaysia.
2.1.2 Sign Language Acquisition

The acquisition of sign language by Deaf children of Hearing parents has received limited research in the past twenty years (Winn, 2007, 59). As mentioned earlier Lady E.M. Templer founded the Federal School for the Deaf in 1954 after she was informed by a paediatrician, Dr Elaine Field who came across hundred of Deaf children who received no form of help of any kind (Saleena, 2004). The Deaf children were left unnoticed, not helped, uneducated; therefore, they were not able to have an effective communication with their parents. It has led to the foundation of the Federal School for the Deaf, which started with only seven students. It is believed that from that moment, the Sign Language gradually came to exist. Deaf children born to the Hearing parents (who are not aware of BIM existence) started to acquire sign vocabularies (not a sign language) only when they attend school at the age of seven.

However, they actually acquired coded languages from their school teachers, which have been introduced earlier as BMKT and SEE. It is consistent with what has been observed in the Malaysian schools that do not use the sign language of the Deaf community, as MFD (2000) reported that form of manually coded Malay Language and English are still being used in educational settings. While the students were outside classroom at the schools or at school dormitories, they learned sign vocabularies from their peers. They were interactive to one another, utilizing the sign language structure without realizing that they were using it. They developed sign language by inventing more sign vocabularies; then shared the discoveries with younger students at schools. Winn (2007) proposed that schools for the Deaf children played an important role in socialization and transfer of sign language. It is line with this quote: “Language has fundamentally three roles in bonding a group of speakers to one another and to their
culture. It is a symbol of social identity, a medium of social interaction, and a store of cultural knowledge.” (Gesser, 2007, p. 271) It probably has a positive impact on sign language use.

Deaf children born to Deaf parents or Hearing parents, acquire sign language differently. Thomson, Kennedy and Kuebli’s (2011) recent finding shows that the children’s Hearing mothers engage less in the sign language interaction with them as they enter toddlerhood (approximately 24 months) as the mothers get frustrated with the language development process. In that case, the first two years are very important for language acquisition, among Deaf children; they need to be exposed to sign language before their mothers become more frustrated. The way the Deaf toddlers are exposed to language is different from the Hearing toddler; so it is assumed that the mothers of the Deaf toddlers would have to work harder to get the attention from them through visual. For those Deaf children born to Hearing parents who do not know or aware of sign language are experiencing language delay until they attend school for the Deaf as it is difficult for them to acquire mother tongue from their parents at home. It is a different experience for those Deaf children born to Deaf parents. The children acquired sign language, as their first and native language from their Deaf parents, similar to those Hearing children acquiring their mother tongue from their Hearing parents. The Deaf children of Deaf parents and Hearing children of Hearing parents should have many similarities and experiences, which has been confirmed by Meronen and Ahonen (2008) in spite of the fact that sign language have developed in alternative transmission systems in visual-gestural channels, signed and spoken languages have the same kinds of organizational principles, rule systems, and grammatical complexity, expressive power, and capacities for creating complex linguistic systems (Meronen and Ahonen, 2008, 496).
2.1.3 Sign Phonology

Phonology describes the level of analysis at which meaningless, contrastive units of language combine to form meaningful units. As for sign language, the same level of analysis has been applied where phonology is visual with handshapes (Figure 2.5), movements (Figure 2.6), location (Figure 2.7), orientation (Figure 2.8) and non-manual expression combined to form signs (Valli and Lucas, 2001). It is important to produce signs with correct phonology. One sign vocabulary could be meaningless if one of the phonologies is formed wrongly. It is often seen in Deaf children when they are producing the sign vocabularies.

Figure 2.5: Handshapes. Both of the sign vocabularies are using the same handshape.

The handshape is “A”

![Handshape Image](image1)

(ADULT) (AUNTIE)

Figure 2.6: Movements. Both of the sign vocabularies are using the same movement.

The movement is arching upwards, in a semi-circle motion

![Movement Image](image2)

(TEENAGER) (ADULT)
**Figure 2.7:** Locations. Both of the sign vocabularies are using the same location, which are on the sides of the forehead

![EMPLOYER](image1) ![CHAIRPERSON](image2)

**Figure 2.8:** Orientations. Both of the sign vocabularies are using the same orientation. Their hands are facing upwards

![NOW](image3) ![WANTAN MEE](image4)

The young children often did not make many of their signs in exactly the same way as their parents, yet the parents in most instances appeared to understand their children’s production (Bonvillian and Siedlecki, 2000, 45). However, the children may produce handshape errors when using signs to communicate with their parents due to the lack of mobility, hence, they will produce slightly different movements, handshapes, location and orientation when producing a sign. The children will continue to learn with mobility, therefore, the parents should keep supporting, guiding and encouraging them to use signs so that the children will acquire sign vocabulary with strong positive results.
2.2 **Children Language Development**

From birth, children will acquire language, any language that exists in their society. Communication between an infant and a caregiver/mother would have started from birth. Therefore, it is essential for the caregiver/mother to start talking to the infant so that the infant can start to pick up sounds. Watson, Watson and Wilson (1999) cited the contribution of evidence Anisfeld (1984) made on how infants have developed pre-linguistic vocalizations skills in the first 8 weeks of birth. According to Anisfeld, there are two types: the vegetative sounds (burping, swallowing, spitting up, and the like) and the discomfort sounds (reflexive, crying and fussing). The infant’s verbal language skills may not exist or are minimal but they should not be underestimated (Gonzalez-Mena & Eyer, 2001). Infants normally communicate their needs by their facial expressions (Gonzalez-Mena & Eyer) and they have unique systems that are not easily understood, even with people the infants are attached to.

2.2.1 **First Language Acquisition**

From birth, the children naturally learn their first or native language at their home. This kind of acquisition is an effortless achievement. First language acquisition amongst children does not require systematic instruction (Guasti, 2002). Guasti (2002) added that language develops spontaneously by exposure to linguistic input on the basis of what children hear. It does not make a difference even if it is Deaf children who will also able to be exposed to linguistic input on the basis of what they see. According to Botting (2006), children, age between 8 to 10 months, learn to understand simple phrases and gradually the meanings of individual words. Botting (2006) also mentioned that at the age between 8 to 10 months, the children’s receptive vocabulary ranges from about 10
to 150 words which have been cited in Fenson, Dale, Reznick et al. (1994). Therefore, by 18 months, the children can understand 200-300 words.

Watson, Watson and Wilson (1999) suggested that eighteen months to two years of age (24 months) is a period of rapid language growth. Children, age between 10-12 months, start to produce their first meaningful linguistic expressions (single words) (Guasti, 2002, 24). Therefore, by 2 years old, a child will have at least 50 words which also means they are able to begin with two-word combinations, for example “dad work” or “mom angry”. The children will be able to produce more 3-4 words sentences, answer simple questions, and relate to events of the day. This occurs by the age of 3-years-old.

By the time children reach 24 to 30 months, their vocabulary may increase to as much as 200 – 300 words. At this rate, children should be able to proceed to a more complex language structure, expressing complete sentences.

Around that time, the children will repeat word patterns they have heard from others. The children will repeat it over and over in their process of constructing language while they learn the word-order patterns common in their language. Comprehension develops gradually through exposure to language and through opportunities to practice language, for example, dramatic play, finger plays, or dictating stories (Cromwell, 2000). In addition to that, adults play a significant role in fostering language by providing many opportunities for children to experience and develop language. It can be done through social model, such as in carrying conversation with the children and early intervention programme. The Deaf children (of Deaf parents)’s language acquisition has the same maturational timetable and the same milestones as that of Hearing children (of Hearing parents) using spoken languages (Meronen and Ahonen, 2008, 496). However, Rush (2011, p. 9) suggests that “the Deaf children are able to sign months earlier than
Hearing children can speak” if both of the children are exposed to their sign and spoken languages respectively simultaneously. It is an advantage that Deaf or Hearing children should have to take seriously in order to develop sufficient basic sign language to start basic communication with their parents as early as possible. Thomson, Kennedy and Kuebli’s (2011) already mentioned that the first two years is a vital period of language acquisition. If sign language can be acquired earlier than spoken language, the Deaf children should have acquired a number of sign language’s vocabulary by age of two.

2.2.2 Social Development

Language acquisition takes place in conversations. Usually, children learn language from adults as well as older children through conversations. In order to initiate language usage, children will need to interact with other children as well as adults. This will enable the children to receive effective language experiences. Just interaction between children and their parents will limit the children from developing social skills. Once mobility is obtained, the children will be able to interact with different people. They will also attempt to produce the sounds they have heard used by adults. The adults – in turn – will correct the sounds by repeating the sounds in a correct way without telling them they are wrong. One must not criticize children’s speech patterns (Watson, Watson & Wilson, 1999). Similar theory also applies to Deaf adults with Deaf children, who use visual gesture. Sign Language is a comprehensive, systematic, and sophisticated language that Deaf children and adults comprehend fully in conversations with each other (PribankiKj & Milkovikj, 2009). Adults need to respond to their children’s interaction so that they will keep using language.
Between 12 to 18 months of age, children are more adept at dealing with older children and adults than with their peers (Watson, Watson & Wilson, 1999). We have to bear in mind that the adults are aware of the children’s language progress, and the children will start to use longer phrases to communicate. Language is used as a vital tool for thinking (Gonzalez-Mena and Eyer, 2009). Watson, Watson & Wilson (1999) proposed that at the age of 24 months, children enjoy the company of other children, they begin interacting. Also, it is possible to involve children in group interest centers, for instance, sitting at the same table and playing with play dough on an individual basis. With the ability of using and understanding language, these children will be able to have social and emotional confidence (Cromwell, 2000; Rush, 2011). Relationship between children and adults, other than parents, are important for language development. The relationship allows the children to start language-based communication with adults (Katz and Snow, 2000).

However, there are some cases where children may not be ready to speak and individual biological readiness varies for each child. Sometimes it may take a child 20 months to speak a language and some are exceptionally talkative at an early age. Children are on their own “schedule” (Jalango, 2000). As Meronen and Ahonen (2008) has confirmed that capabilities of Deaf children of Deaf parents are similar to these Hearing children of Hearing parents, Deaf children of the Deaf parents will go through the exact same stages. Socialization is vital to a child’s growth and without a common language, socialization is limited (Lane, 1992). Socializing influences the vocabulary development children go through at home and in a child care setting (Katz and Snow, 2000). In this way, the children will be able to learn words – animals, colours, food, clothing, plant and many more. They also offer information about how words within a domain are related (Clark, 2003, 6).
In learning to participate in conversation, the children learn more of their language as well as communication protocol such as how to address person and when to respond. It is embedded in and supplemented by gesture, gaze, stance, facial expression and voice quality in the full array of option people can use for communicating (Clark, 2003, 8). Cultures differ in how explicitly language is taught (Hoff, 2009). The way Hearing children acquire their language is different from Deaf children. The Hearing children will start with listening to sounds around them while the Deaf children will not be able to do so. It is necessary to make the Deaf children pay attention, have eye contact with their parents so that the children will see the message that the parents are conveying. Thomson, Kennedy and Kuebli (2011:41) suggest that “physical contact, eye contact, and facial expressions are essential for effective communication.” As Deaf children do not have or he limited hearing ability, physical contact instead of attention by sound, eye contact instead of listening and facial expressions instead of tone play the more significant roles in sign language acquisition among Deaf children. Although the Deaf children have achieved their mobility, they still need more time to adapt themselves to the environment with the support from adults in acquiring Sign Language.

2.2.3 Early Intervention Programme in Language

A hearing impairment can make learning very difficult for children (Santrock, 2006). Deaf Children without intervention could result in language delay. Children with hearing disability usually do not develop normal speech and language in the first several years of life. Although the language delay can be avoided if the parents start to use language to communicate with the Deaf children from birth, however, parents do not start early enough (as soon as possible). It is often said that the children do not see the parents signing. This personal view may be wrong as the children have no control over
their motor skill, therefore, the children do not appear to pay total attention to their parents (Hearron and Hildebrand, 2009). “Both fine and gross motor skills are critical to language and cognition,” Rush (2011, p. 9). The fine motor is used for cutting and writing and the gross motor will “bring the hands and arms together just above the waist at the middle baseline of the body” (Rush, 2011, p. 9). Despite these arguments, the Deaf children still need instructions and guide from their parents to exercise their motor skills as early as possible. It will allow the children to use their hands accurately to form sign vocabulary. Usually, the children between the age of three and five will be able to move on to master the motor skills that can form the basis of the games they enjoy in primary school (Hearron and Hildebrand, 2009). Early intervention is the main way to help a child with special needs to reach his or her full developmental ability (Gonzalez-Mena and Eyer, 2009).

Motor skills need to be developed well in order to enable the children to use Sign Language to communicate with their parents. With Sign Language, the children will be able to convey their message to their parents so that the parents understand their requests. According to Hearron and Hildebrand (2009), the children have already shown their motor skills at birth. Children are able to lift up their heads and use their hands to hold things before they can stand or walk. The physical-motor development is much faster than the development of the vocal tract (Rush, 2011). By the end of 24 months, the motor development is considered complete as more fluid movements are possible, and the children will be able to produce a larger vocabulary of signs (Garcia, 2003). Children with well developed physical motor skills will be able to sign a word at the first stage, using Sign Language they have been exposed to be taught by their parents. The children will be able to use simple signs to convey their needs. The children with hearing disability will not display the startle reflex such as extending legs, arms, and
fingers, and arch its back to response to sudden loud sounds. They will need to go through a session where they will be able to practice their motor skills. This is so that they will be able to flex their fingers and hands when use Sign Language. The skills can be done through play activities.

Language introduction to children has no specific order, enabling young children to enjoy a variety of experiences in a language-rich early environment (Cromwell, 2000). Cromwell adds that children acquire communication skills through play, through social exchanges and through organized activities which allow themselves to be exposed to more active and extended language. However, children should not learn language alone but with their peers. Play is the main curriculum for any infant and toddler program and it has been recognized as vital to growth and learning. Through play, children will be able to enjoy the opportunities they have so that they will be able to develop new skills and learn new concepts. They have the freedom to play with their own power, self-direction. Playing will be a great experience as they are not confined by rules, procedures or outcomes. Not only is this advantages, children will be able to make more discoveries, choices and find out what interests them.

2.3 Special Needs for the Deaf Children

Children with different disabilities will need different approaches for sign language acquisition. It is a must to understand the condition of the disability that a child may have so that he/she will be able to meet his/her needs. In order to make the children feel comfortable with their own disability, the children need go to through the Maslow’s hierarchy of needs that is the “five need-levels” which are physical needs, safety needs, social needs, ego needs and self-actualization needs (Watson, Watson & Wilson, 1999).
The children will have to go through the levels step by step, so that they will be able to move to an upper level smoothly after fulfilling the first level. At the first level, it covers food, air, water and shelter, then followed by the second level which makes the children feel protected from being harmed, have a sense of security and consistency. Social needs will enable the children to build friendships, companionships and bonding, while their ego needs will assist them to feel that they are important and are considered special. The highest level which is self-actualization needs to enable the children to help others, being creative, grow spiritually and so on.

2.3.1 Assistance for Deaf Children’s Language Acquisition

The Deaf children watch their language from birth just like the Hearing children listen to their language from birth. PribankiKj & Milkovikj (2009) has suggested that individuals who learned Sign Language from birth performed better on linguistics and memory tasks than those who started learning Sign Language after puberty (around 3 years old). It is confirmed by Guasti (2002) who found that Deaf exposed to American Sign Language, shorten as ASL (in same family with BIM) from the birth performed better than those exposed from 4-6 years of age. The children’s language growth is strongly influenced by parents and families (Jalongo, 2000). Not only that, the type of language environment the families have provided is another factor of contribution to language growth. Beattie (2001) encourages the families to make important decisions about language development as quickly as possible in order to minimize any possible language acquisition delay.

The involvement of parents and the local community is the key to helping children achieve their potential both educationally and socially (Whalley, 2001). There are four
important roles that parents will need to take to support and encourage their children’s language progress (Jalongo, 2000). They are as follows: the first role is as observers where the parents monitor the children’s progress, build on their strengths, and help them meet new challenges in language; the second is environment arrangers where the parents contribute to the language growth by creating “print rich” environments, for instance, use recycled paper or simple writing implements or borrowed books from a nearby library; the third is that parents act as interactors to carry on extended conversations and really listen to what their children have to say; and the last role is as motivators and encouragers where the parents should recognize the children’s functional language needs, stimulate the children’s interests and encourage a response to their efforts to communicate.

The parents should start “real talk”, adult talk and include the Deaf children when talking to other adults (Gonzalez-Mena and Eyer, 2009). This will enable the Deaf children to develop into a full language, so that they can be native speakers. Rush (2011, p. 2) suggests that “with consistent use of signing … the children became empowered to express themselves more readily and more appropriately than other preschoolers did not have signs available to them.” It is parallel with Marschark and Hauser (2012) argument that the parents’ capability in assisting their children to access to earlier and fluent language would help the children master the language. The Hearing parents of Deaf children may not be able to provide the same assistance to the Deaf children as Deaf parents can. As a result, the children are learning a degenerate language because the children receive a little linguistic input. There is supported by this quote: Deaf children born to late learner of ASL receive very rudimentary linguistic input because their parents avoid complex structure and often omit function morphemes (Guasti, 2002). Some Deaf parents are just as incapable as the Hearing parents who are
not signers, as the Deaf parents may not fluent in sign language, too; therefore lacking sign vocabulary. These parents need to start or improve on their sign language acquisition as early as possible and talk to the children long before they acquire the ability to sign. There is no standard method in parenting children; therefore the parents will have to adopt themselves quickly with their children’s learning. It will not be helpful if the children have to work within an adult-imposed framework (Whalley, 2001). It is important for the adults to have proper timing and level of intervention so as not to hinder the children’s learning.

2.3.2 Deaf Culture: Communication Way

Sign Language is associated with Deaf culture. The culture Deaf people live in is different from the culture Hearing people live in. The Deaf culture involves sight and tactile movements. As mentioned earlier in section Social Development, it is necessary to make the Deaf children pay attention, have eye contact with their parents so that the children will see the message that the parents are conveying. The Deaf children must switch to visual attention between reference and information when the adults are assisting them in the learning process (Guarinello, Berberian, Santana & Massi, 2007). Therefore, the parameters of visual communications need to be respected. As such, language input and attention happen sequentially, making the task of grasping the connection between language and experience much more complex.

PribankiKj & Milkovikj (2009) proposed that the mothers should sign to the infants as close to the object the infants are looking at or their field of vision so that the signs can be seen and the message will be communicated to the children. PribankiKj & Milkovikj
also added that facial expression transmits important linguistic and effective messages while signing and mothers’ faces are kept totally visible to the Deaf children.

2.4 Sign Vocabulary Assessment

Children who acquire a second language before the age of 3-years-old are generally referred to as simultaneous bilingual (Katz and Snow, 2000). However, when the children learn sign vocabulary, they are exposed to written languages their parents have shown them, like children’s pictures on posters or on books with the written word.

Prezbindowski & Lederberg (2003) have suggested that in the early stages of vocabulary development, individual words are infrequent and their occurrence is unpredictable. It is difficult to assess how much vocabulary the children actually have acquired from birth. PribaniKj & Milkovikj (2003) has suggested that naturalistic observations are the way to assess how children use vocabulary in ongoing interactions and therefore are essential for assessing functional communication.

By the age of 2 years or 24 months, children typically have at least a 50-word vocabulary in their spoken vocabulary (Botting, 2003). In comparison, Deaf children should be able to express a 50-sign vocabulary without being asked. However, it also has to depend on the degree of the Deaf children’s exposure to the Sign Language provided that they can only see the language from their parents and other adults who know Sign Language. Rush (2011) mentioned that both Deaf and Hearing children are able to acquire sign language earlier than spoken language. Therefore, it should be assumed that the number of acquired sign vocabulary should be more than just 50 by two years of age.
2.5 Summary

This chapter has reviewed language acquisition development and how it is useful to the Deaf Community, and how the Sign Language should be acquired by the Deaf children. More details on children’s language development have been presented and are relevant to any language acquired by children. Sign Language is considered a real language as it has its own grammar and structure, in different method in expressing and receiving messages.

The following chapter presents the procedures and methodology of data collection and analysis. It includes background of the four subjects mainly on language learning, interviews from their parents, careers and sign vocabulary the children has learned prior to the formal learning activity sessions conducted. The detail of sessions is briefed as well in the same chapter.
CHAPTER THREE:
RESEARCH METHODOLOGY

3.0  Introduction

This chapter elaborates on the methodology used to carry out this research; the procedures for data gathering and analysis in order to answer the research questions set out in Chapter One. Specifically the discussion covers the description of the four subjects, the instrumentation used in the study, and the data collection and analysis procedures. As such, this chapter provides the framework that justifies the choice of the subjects, the research tools, and how the data collection procedures aid in obtaining the necessary and relevant data.

3.1  The Subjects

The subjects of this study are four Deaf children, aged between 26 and 31 months as of May 2010. They are all children of Deaf parents. The subjects are referred to as AE, HW, NC and JK. Table 3.1 provides their personal details.
Table 3.1: Description of the Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Age at time of data collection</th>
<th>Degree of Hearing loss</th>
<th>Age when Diagnosed as Deaf</th>
<th>Time spent at Daycare center / Babysitter</th>
<th>Education received at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE (Male)</td>
<td>26 months</td>
<td>100 dB – bilateral</td>
<td>2 months</td>
<td>Monday-Friday 7am to 2pm</td>
<td>Sometimes with 5 new words and reviewing 5 previous words</td>
</tr>
<tr>
<td>HW (Male)</td>
<td>30 months</td>
<td>100 dB – bilateral</td>
<td>9 months</td>
<td>Monday-Friday 7am to 7pm</td>
<td>Every night for 20-25 minutes with books</td>
</tr>
<tr>
<td>NC (Male)</td>
<td>31 months</td>
<td>55 dB – bilateral</td>
<td>3 months</td>
<td>Tuesday-Thursday 8am to 5pm</td>
<td>NIL</td>
</tr>
<tr>
<td>JK (Female)</td>
<td>28 months</td>
<td>90 dB – bilateral</td>
<td>18 months</td>
<td>All day with grandmother</td>
<td>NIL</td>
</tr>
</tbody>
</table>

Note: The decibel (dB) is a logarithmic unit that indicates the level of hearing ability. Bilateral is defined as hearing impairment exist in both ears.

Subject 1, AE, is 26 months old, and is born Deaf. He has one elder sister, 4 years old who is not Deaf. Both siblings attend a nursery center, which is located just next to the school where his mother works as a teacher for Deaf students during the weekdays. His father works as an IT officer in a government department. His parents usually work from Monday to Friday. When his mother goes to work, she will send AE and his sister to the center. There are several hearing children and one Deaf child playing and communicating with them at the nursery. His mother will pick them up between 2pm to 3pm before going home. His mother is with AE and his sister at home every day after school. His father does not usually spend time with him during the weekdays, except on public holidays. There is no home education for AE. His mother said that she usually teaches AE five new signs and reviews the five signs daily. The home education occurs in the home when a parent teaches new words to young child whenever the parent sees it are a necessary. Most of the signs being taught to AE are for communication.
purposes, for example, requesting for milk and chocolates, clothes changes, or when his mother asked him not to touch a vase on a table.

Subject 2, HW, 30 months old, was born Deaf and is the only child in his family. Both of his parents have Deaf siblings, 2 on his father’s side and 4 on his mother’s. Due to their jobs, his father is a senior interior designer and his mother, a clerk; his parents have to send him to a babysitter, during the weekdays. Also under the care of the babysitter, are two hearing children, who are his play mates. HW stays with his babysitter from around 8am and to around 7pm. At home, it is his mother who would most of the time; sit with HW in the evenings to teach him for at least 20 minutes six days per week. His mother uses reading materials to teach HW. His father usually comes home late; therefore he does not spend much time with HW.

Subject 3, NC, 31 months old, was born Deaf to a Deaf couple. He has a Deaf sister, now 6 years old. His mother usually sends him to a babysitter nearby, Tuesday through Thursday when his mother has to send NC’s elder sister for intervention classes at the YMCA. According to his mother, she plans to register him for intervention classes at the same YMCA, very soon. His father is the sole breadwinner in the family, working in a factory. Neither his mother nor his father has ever done any teaching sessions at home for their son.

Subject 4, JK, 28 months old was born Deaf. She is the only child of a Deaf couple. She has univentricular heart disease and Waardenburg Syndrome, which is defined as a rare genetic disorder most often characterized by varying degrees of deafness, heterochromia iridis, and white forelock, minor defects in structure arising from the developmental anomalies of the eyelids, nasal root, and eyebrows (Wright & Spiegel, 2003) and had
been through two surgeries, when she was just 1-day-old and again at 25 months. Her parents work at a café in a hospital in Penang. JK requires special care due to her health condition. Therefore, she is being put in her maternal grandmother’s care in Selangor. Her grandmother is a hearing person and in the same house also live the child’s hearing relatives (aunty, uncle and cousins). Her grandmother gives JK good daily care, therefore JK feels more secure with his grandmother, than with her own parents. Her parents visit her at least once a month, and most of the time it is only her mother who comes. Her grandmother is a retired teacher for Deaf students in schools and two of her children are Deaf, therefore she knows how to communicate in sign language. However she does not have regular sign language learning sessions at home for JK.

3.2 Instrumentation

This study employs three research techniques: formal learning activity sessions, interviews and observations to explore and gather data on the subjects’ language use. While the formal learning activity sessions are the main source of data, information from the interview and observation sessions will supplement the analysis, where relevant. All the formal learning activities, interviews and observation sessions are videotaped so they can be repeatedly referred to during the analysis.

3.2.1 Formal Learning Activity Sessions

An early intervention programme (EIP) worker is employed in these sessions to make the observation and collection of data possible. The EIP worker assisting in this study is someone who has worked with Deaf children for many years and has a good command of the Malaysian Sign Language. The EIP worker has volunteered to assist in this
research project as the researcher has no experience in the early intervention programme. The researcher will be observing the sessions carried out by the EIP with the four subjects and taking down notes. Another volunteer will be operating the camcorder.

Three activity sessions, each lasting 40-45 minutes, will be carried out and each of the session which will cover five activities. Each session begins with a simple and brief introduction and instruction to the subjects, followed by five activities. These five activities will be repeated in the second session and again in the third sessions so that it is easy to see if there is any progress in the subjects’ acquisition of the target sign vocabulary. Each of the activities has several target sign vocabulary, and the subjects are expected to produce the signs as answers to the tasks given. The five activities are:

a) **Putting round chips into board columns.** (Refer to Appendix 1) It is a warm-up activity to help build rapport between the EIP worker and the subjects as these subjects are not familiar with the worker. Through this activity, the worker trains the subjects to develop their attention span and to build up a simple sign language vocabulary as well as learn to follow instructions. There are two chips which are green and purple. Therefore, these colours will be the targeted sign vocabularies in the sessions. The EIP worker will ask for the green chip from the subject, hoping that the subject will return her a green chip after the worker signs GREEN.

b) **Matching picture to picture.** (Refer to Appendix 1) There are four sets of the same pictures which show a bowl of soup, a tomato, a burger and some jelly. These pictures are signed to the subject. The other signs “where”,
“same”, “give-to-me”, and “find” are introduced as well. These signs are aimed to help the subject identify the items in the pictures. The purpose is to help the subject build receptive skills by showing understanding of the instructions given and expressive skills by naming the objects in the pictures by signing them. In this activity, the EIP worker introduces a variety of ways to engage the subject in conversation. The worker teaches the target signs while showing the pictures and then arranges the pictures on the floor. After that, she asks the subject to find the picture similar to the one she is holding. Then the worker signs the picture again and asks the subject to pass the picture to her. This activity is also carried out in another way where the worker first signs the picture, and then asks the subject to show the picture by signing “tomato where?” (Where is the tomato?), for instance. In the following session, these pictures are taken out and shown to the subject. The subject responds in sign language and a correct sign indicates she/he has learnt the sign taught for that session.

c) **Animal Farm.** (Refer to Appendix 1) The aim of this activity is similar to the other activities, that is, work with the subjects in building new sign language vocabulary, this time the signs are of animals, i.e. “horse”, “goat”, “sheep”, “chicken”, “cow”, and “duck”. The rest of the sign language vocabularies related to a farm are “car”, “man” and “apple”. The EIP worker takes out each of the animals/objects and shows it to the subject. The subject is taken as to have learned the signs of that animal/object if he/she is able to respond correctly. When the subject has learned a sign, the EIP worker will show a new sign to the subject. After all the animals/objects have been introduced, she takes out a felt cloth poster and lays it on the floor. Then the
subject places all animals/objects on the cloth. The subject can also match the animals with the same pair. As a variation, the worker signs the animal/object then the subject is expected to either point to the corresponding animal/object or pick the animal/object up and give it to the worker. The worker can also initiate a storytelling session based on the animals in the farm, for example, “cow eats grass”, “duck is in the pond” and “father drives car” in hoping that the subjects will place the animal/object in the correct position as requested, for the example, put the car next to the man and put apple on a tree.

d) **Cutting and cooking.** (Refer to Appendix 1) In this activity, the subject is taught sign language vocabulary of food: egg, bread, tomato, cabbage, cheese bun, onion, corn, and vegetable, and utensils: fork, spoon, knife and plate. While the subject is learning the signs, he/she participates in role play, such as making a sandwich, breaking the eggs, and cutting the cabbage. The purpose of this activity is to allow the subject to touch the things and understand how these signs are invented. For example, these signs are invented based on the appearance of the things or how the things are used.

e) **Reading Jovi.** (Refer to Appendix 1) The title of the book is *Jovi.* The objective of this activity is to help the subject comprehend the story and pick up the words signed in the story. Signs for “kangaroo”, “kancil” are the targeted sign vocabulary in the activity, however, some extra sign vocabulary such as “ball”, “play”, “drink”, “water”, “sleep”, “help”, “bite”, “string” and “boring” are also introduced to the subject. The subject is encouraged to create his/her own story, based on imagination. Through the
retelling of the story, the attempts, and the number of signs they know, are all noted.

The specific objectives of these five activities are:

a) to introduce new sign language vocabulary to the subjects for everyday words, group names, for example, name of food, animals, question words and verbs;

b) to reinforce the words that the subjects already know; and

c) to identify words that the subjects can recall from previous sessions.

The sign language vocabulary, i.e. tomato, burger, soup, corn, cow, goat and so on - in the sessions - are selected as signs to be taught as these signs are categorized among the easier to learn by the subjects. The sign language vocabulary is concrete so that the children can see them visually. There are several stages which Deaf children need to go through in order to master handshapes. Volterra and Erting (1998) proposed a model of stages of handshape acquisition (Figure 3.1 to Figure 3.4) for the Hearing and Deaf children based on the flexibility of the fingers in expressing the sign language vocabulary as the following in American Sign Language:

**Figure 3.1:** Image extraction of Stage I handshapes

![Image Extraction of Stage I Handshapes](image)
Malaysian Sign Language has many similar signs to American Sign Language. Thus, the proposed model can be a reference for the sign vocabulary selection for the learning sessions. Fifteen of the 29 signs are based on the Stage I model of handshapes. The Stage I is known as BASiC5. The children can form BASiC5 handshapes easily when they are using these handshapes to form sign language vocabulary. When there is a more complex handshape to be formed, the children will use one of the BASIC 5 handshapes to replace the complex handshapes. Garcia (2003) has indicated that the children of the same age will show different dexterity levels, for example, the children will use the handshape “S” ( ) to replace “Y” ( ) for the sign for ‘yellow’. The children in this study have difficulty in forming complex handshapes due to their young age and their motor skills are not yet fully developed.
For the purposes of this study, these activities are carried out with the aim of determining how many signs the subjects are able to understand and express. The language medium in all activities is limited to Malaysian Sign Language.

3.2.2 Interview

The interview sessions are conducted with either one of their parents (mostly the mothers as they are available for the interview sessions and the fathers are away at work) and their care giver/babysitters. These sessions are carried out in their respective homes. The parents’ consents have been obtained for the data collection part of the study. There will be one interview session with the parents to obtain information on the children’s typical behaviour, hearing loss history, communication profile with the people around them and their educational background. The interview protocol can be seen as Appendix 2.

Prior to the learning sessions, the parents are asked to list down the sign language vocabulary the children have produced or expressed on their own without being prompted by anyone. When they submit the list to the researcher, they are asked to show the signs, exactly as the children had expressed to them and to explain the context that caused the children to use the signs. These signs and the parents’ explanation on the signs are videotaped which can be seen in Appendix 7 – the complete list of sign vocabularies and some of the sign vocabularies are extracted as illustrated examples.

The interview sessions with the children’s babysitters are carried out at the babysitters’ homes. The purpose of the sessions is to get in-depth information on the way the babysitters convey messages to and communicate with the children under their care. A
set of questions are drawn for these sessions (See Appendix 3). The questions cover issues such as “in what way the babysitters try to get the children to respond to them?” and “Do the babysitters know sign language? How many sign vocabularies do they know?”.

All interview sessions with the parents are conducted in sign language, however, when interviewing babysitters who do not know sign language, Sign Language interpreting service are used and the sessions are videotaped. The recordings are later viewed, transcribed and analyzed.

3.2.3 Observation

As this study adopts the qualitative approach, observation is considered one of the most suitable data collection methods (Creswell, 2003). The observation takes place during the following events:

a) formal learning activity sessions with the EIP worker
b) the subjects’ interactions with their mothers at home
c) the subjects’ interactions with their mothers when at church, and
d) the subjects’ interactions with their parents at the shopping malls.

The main purpose of observations is to investigate the level of the subjects’ sign language acquisition when they respond to their parents at home, church and shopping places and to the EIP worker during formal learning activity sessions. The data obtained from all observations at home, church and shopping places are descriptive in form, involving the capability of the subjects in using sign language, therefore, all the new
signs they produced during the sessions are taken note of. No numerical data are recorded from these observations as although the research sites are similar (at home, church, and shopping malls) the settings in each place are not the same across all subjects. However, some descriptive statistics in the form of frequency counts from the formal learning activity sessions which are the same for each subject will be reported in Chapter 4.

The information obtained through the observations at the subjects’ homes, church and shopping places are obtained through the following questions:

  a) How does the subject show understanding of what his/her mother is saying?
  b) How does the subject pay attention to her/his mother?
  c) What behavior or specific communication pattern does the subject show?
  d) How does the subject respond to strangers and people around him/her?

The information obtained from the observation sessions can verify the information obtained from the interviews with the parents and care givers/babysitters and the data collected from the formal learning activity sessions. These actions and responses by the subjects are videotaped and will be reported in the next chapter so as to complement the video-recorded data and provide a background for the analysis of the subjects’ level of sign language acquisition.

3.3 Videotaping

Observation and written notes for formal learning activity sessions may not be adequate to record all the crucial details due to the spontaneity of interaction, or when there is too much to be noted down and observed at the same time. These disadvantages can be
overcome by using one camcorder to record all the sessions. The recorded data can be reviewed and analyzed in depth repeatedly after the interaction has taken place. These data contain all the details of what has been said and the transcription helps in increasing the reliability as well as accuracy of the analysis, thus serving as evidence that supports the discussion in the next chapter. In the formal learning activity sessions and observations, there are some features important to the analysis of the language application as they might reveal the level of the subjects’ language acquisition. Without the camcorder, it will be difficult to pay attention to the facial expression and signing hands simultaneously.

3.4 Data Gathering

The data collected using the camcorder will be transcribed in detail. The details needed for the study are to determine the following:

- The level of sign language mastery presented by the four Deaf subjects.
- The influence of their individual linguistic environment on the respective subjects’ level of mastery in sign language.
- The effect of the input and practice on the sign language acquisition.

3.5 Data Analysis

The data from the formal learning activity sessions are mainly analyzed to determine how much the subjects understand the learning activities. Therefore, the responses from the subjects are recorded based on the subjects’ ability to:
a) provide the correct response (sign) – when the worker shows a picture of a "cow", the subject is expected to answer "cow" by signing it.

b) perform the right action – when the worker makes a request "Give me the burger" by signing "burger", the subject is expected to pick up the picture of the "burger" and then pass the picture to her.

c) imitate the worker’s sign vocabulary – where the subject re-produces the sign language vocabulary after the worker when the worker introduces the targeted sign.

There are 29 targeted signs in total used in all five learning activities mentioned above. The frequency of each subject’s correct responses to the worker’s tasks, which is to answer with the correct sign language vocabulary and to perform the right action, is recorded for both the expressive and receptive levels. The sign imitation and mistakes made by the subjects are recorded as well. To measure how many targeted sign language vocabulary the subjects are able to recall in all sessions, the total of correct answers provided by the subjects for each targeted sign in a session is tabulated. A comparison report shall be carried out to find out if they have shown a better performance in previous sessions.

As discussed in Chapter 2 regarding the sign language development among Deaf children, it is suggested that the children between eighteen months to two-years-old will be able to utter at least 50 words, hence, they are able to begin with two-word combinations, for example, “dad work”. By the age of 24 to 30 months, the children’s vocabulary should increase to as much as two to three hundred words. The children’s receptive vocabulary ranges from 10 – 150 words at the age of between 8 to 10 months, therefore, by 18 months; a toddler should be able to understand 200-300 words. As for
the research being carried on the Deaf children, it is expected that the Deaf children will meet similar milestones as described in Chapter 2. The data collected from the interview, observation and formal learning activity reports will determine if the Deaf children have produced more than 50 words in terms of sign vocabulary and if the children are able to construct two-word sentences.

3.6 Summary

This chapter presents the procedures and methodology of data collection and analysis. It includes the background of the four subjects covering their language learning activities, and the sign language vocabulary they are able to express without being prompted prior to the formal learning activity sessions conducted. Details of the learning activity sessions are also provided to give a clear picture of the data gathering process.

The following chapter will present the analysis of the data collected mainly from the learning activity sessions conducted by the EIP worker as well as the interview sessions with the parents and the caregivers to determine their progress in language learning and acquisition.
CHAPTER FOUR:
DATA ANALYSIS

4.0 Introduction

This chapter consists of five main parts. It begins with the findings from the interview with the parents of the four Deaf children (coded as AE, HW, NC and JK) followed by the findings from the observations which were carried out in their homes, churches (except AE because he is a Muslim) and shopping centres (except JK who cannot be exposed to public places too much due to her health condition). The third section discusses the sign vocabulary of the children and the results of the assessment of their ability to express themselves naturally using the signs they have acquired without being prompted. A discussion on how they acquired these signs will also be provided in this section. The fourth section reports on the findings of the in-depth analysis of the children’s learning through the activities carried out by an experienced Early Intervention Programme (EIP) worker. These sessions were recorded using camcorders to facilitate the analysis.

As already described in Chapter 3, the data was collected at the four Deaf subjects’ houses and their babysitter’s houses/centers to obtain a picture of the subjects’ exposure to sign language and sign language mastery prior to the facilitated sign language learning activities, which were carried by an IEP worker. The data obtained examines not only the level of expressive and receptive sign language mastery presented by the four Deaf subjects, it also examines the subjects’ parents’ background in acquiring and using sign language in their early age. Their parents’ sign language mastery can influence the subjects’ sign language development.
4.1 Findings from the Interview: Parents’ Background or Respondents’

Background or Both

The interview was conducted with the Deaf parents and babysitters of each Deaf child. The interview sessions were carried out to find out how much time the children spend with their parents on a daily basis and to gauge the ability of the children to communicate effectively with their parents and babysitters. It was also to find out how the parents dealt with their children’s deafness and the children’s language development. In Malaysia, sign language is not popular among the public and it is uncommon for the public to see Deaf people using sign language. Due to the nature of sign language, it is neither widely seen in the streets nor on the media as compared to spoken languages which are widely used on television, radio and by the communities. Through the interview with the parents, information was obtained on how they tried to provide opportunities for the children to be exposed to sign language and to practice using the language as much as possible. All of the parents and babysitters were interviewed once (Refer to Appendix 5).

4.1.1 Subject 1: AE

At the time of the interview, AE was 26 months old. AE’s parents grew up in different environments; therefore they received different levels of exposure to sign language usage and have different perspectives about the language. AE’s mother grew up speaking with her family while his father grew up signing with his family despite the fact that both of them were born deaf. Hence their communication preferences are different as the mother usually speaks while signing and the father just signs. As such, AE was confused because he was not sure whether he should just speak or just sign or
speak and sign. According to his mother he demonstrated the desire to speak like his Hearing elder sister, by producing sounds to catch his mother’s attention *(Refer to Appendix 1)*. And AE did not use sign language often.

AE was 12 days old when his parents realised that he was actually Deaf. Even so, his mother did not start any home education with AE, which may have benefited him in the sense that he could learn many sign vocabulary from books and materials as a preparation for acquiring sign language. His mother taught AE some random signs which she felt was necessary for him to understand in order to manage the basic communication at home. Hence, AE experienced a delay in sign language acquisition because he depends only on his parents for opportunities to be exposed to sign language. As indicated by his mother in the interview, AE understood most of what she says or instructs him to do at home. However, despite the fact that AE understood almost all the instructions from his mother, sometimes he still does not respond to her requests *(Refer to Appendix 1)*.

As for AE’s grasp of sign language, it was not that easy to understand him as his signing skills were not good, as can be seen in **Figure 4.1**.

**Figure 4.1**: Sign vocabulary for RED
Figure 4.1(a) shows the mother signing RED while Figure 4.1(b) shows how AE signs RED. Figure 4.1(a) shows the correct sign, while Figure 4.1(b) shows AE has signed wrongly although he used correct sign vocabulary he signed it in the wrong location.

AE’s responses to some simple questions asked by some adults, who were trying to interact with him, were out of context. He aimlessly pointed at various things and in different directions. Besides that, AE’s father was also constantly struggling to understand what AE tried to communicate to him, as can be seen in Figure 4.2. It was difficult for his father to decode the sign vocabulary expressed by AE.

**Figure 4.2: Sign vocabularies for EAR and MOBILE PHONE**

The sign vocabulary in Figure 4.2(b) is EAR. The sign shown is not correct because it lacks one of the phonologies, which is handshape. The correct handshape for EAR should be “F” (ʼ) and the sign user completes the sign by pinching the earlobe and wiggling it a bit.
The sign vocabulary in Figure 4.2(d) is MOBILE PHONE. The sign shown is not accurate because it lacks one of the phonologies, which is handshape. The correct handshape for MOBILE PHONE should be “Y” (ﮫ) and is placed on the ear as if talking on the phone.

From Figure 4.2, we can see that it was difficult for his father to differentiate the signs and it would be out of context. It was reported that his father had actually spent less time with AE in comparison to his mother. Therefore, his father was not familiar with AE’s early signing. Just as with Hearing babies and toddlers, when they talk in baby language only people who have spent time with them and are familiar with their baby talk, would understand what they are saying. AE had not practiced sign language in terms of expressing his thoughts and curiosity as it was reported that AE mostly pointed things out when he sees something that draws his attention. However, although pointing is common among children learning to communicate, it is not part of sign language and can lead to confusion.

As can be seen in Figure 4.2(b) and (d), the handshapes AE showed are quite obscure. Although the locations of the signs are correct, the handshapes are wrong. He uses the open palm for EAR and a fist for MOBILE PHONE. It was also reported that sometimes AE would use the handshape of MOBILE PHONE for EAR and vice versa.

AE spent most of his time with his Hearing elder sister at the nursery and at home. It was reported that his sister often acted as his “interpreter” at the nursery whenever Ibu, who is the owner of the center, needed to communicate with AE. At the center, nobody communicates with AE through sign language except his sister who can sign well. Ibu
however can understand signs for MILK and SMELLY (defecate) as shown in Figure 4.3.

**Figure 4.3:** Sign vocabularies for MILK and DEFECATE

![Sign vocabularies for MILK and DEFECATE](image)

The sign vocabulary for MILK is correct, as shown in Figure 4.3(a), however, the correct sign for DEFECATE has been substituted with the sign for SMELLY (Figure 4.3(b)) which was used by AE.

These signs are standard words (in this case, these are sign vocabulary) that babies and toddlers would use to express their needs. The consequences of using totally different signs to substitute the existing sign vocabulary could be dire. In this case, DEFECATE is replaced with SMELLY, as such AE will be confused if his mother signs the actual sign for “SMELL” to refer to something else, for example, to say that the bag is smelly. AE’s parents are responsible of making sure that AE uses correct signs to avoid any misunderstanding. Other than these sign words, Ibu could not understand AE most of the time. Therefore there is very little opportunity for AE to be exposed to sign language usage. It can be said that AE is growing up in ‘silence’ as he is unable to acquire sufficient input from his current surrounding at the nursery. AE could not enjoy the same privilege made available whether naturally or intentionally to the Hearing children under Ibu’s care as the children were able to participate in the “listening” and “speaking” sessions at the center.
4.1.2 Subject 2: HW

HW was 30 months old at the time of the interview. The interview found that both of HW’s parents grew up in similar environments, using sign language mainly to talk to their parents as well as their siblings. HW’s father and mother have two and four Deaf siblings respectively. Their parents have the same preference for communication, i.e. using sign language as the main language in their daily lives. Hence it was not a surprise to see the parents using sign language with HW since he was 4 months old. The parents were not aware that HW was Deaf until he was diagnosed as Deaf at the age of one. Even so, HW had been exposed to sign language as early as 4 months old. His parents communicated with him using simple signs like how Hearing parents speak to their babies using simple words.

Among his first signs were DIAPER, FATHER and TOILET with some phonological errors initially, such as wrong handshapes and improper movement. At the time of data collection, HW has already mastered the sign of FATHER and TOILET, as shown in Figure 4.4.

Figure 4.4: Sign vocabularies for TOILET and FATHER

Figure 4.4(a) (TOILET) and Figure 4.4(b) (FATHER) show HW’s mother signing the correct phonology and handshape for these two words. While teaching him, his mother
also showed him the correct sign and exact facial expression that HW had demonstrated recently.

His mother started home education with HW when he was 6 months old. It was reported that when AE began to sign “DIAPER” for the first time as shown in Figure 4.5, that prompted his mother to teach him more signs. This was the first time he understood what he signed and signed almost correctly.

**Figure 4.5: Sign Vocabulary for DIAPER**

![Figure 4.5(a)](image)

![Figure 4.5(b)](image)

The sign (DIAPER) shown in Figure 4.5(a) is correct and is done by using two fingers and thumb (of both hands) that HW’s mother always used with HW. When HW signed DIAPER the first time as shown in Figure 4.5(b) he used the handshape of 5-bent, using all fingers and thumb (only one hand). The mother showed a diaper and HW confirmed it by returning her a smile.

At the beginning, it was tough for her to get his attention as sign language requires eye contact however her efforts were well rewarded, because now, HW is capable of making sentences comprising of more than one word, as shown in Figure 4.6.
Figure 4.6: Sentence structure shown by HW

(a) GET-ATTENTION +  (b) INDEX-POINT  +  (c) ANGRY

Translation: HW patted his mother’s hand to get her attention and then he pointed at a person and signed that the person looked angry. His mother recalled how HW signed this sentence when they were at a restaurant.

The interview also found that HW repeated signs of certain objects several times, every time he saw the object. For example, when he saw a house and a dog, he signed HOUSE and DOG respectively as in Figure 4.7. He would keep signing HOUSE if he sees another house and DOG if he sees another dog. This is a part of his learning progress and it is through this way that the sign vocabulary can be sustained. Repetition of signing the sign vocabulary will help HW remember the sign vocabulary he is learning.

Figure 4.7: Sign vocabularies for HOUSE and DOG
The handshape of HOUSE and DOG are “B” and “5-bent” in Figure 4.7(a) and (b) respectively. HW repeated the same signs when he saw the same things (house and dog, for example) as he recalls what he learnt.

Besides that HW was able to express sign vocabulary for abstract emotions such as HAPPY and SICK as can be seen in Figure 4.8.

**Figure 4.8:** Sign vocabularies for HAPPY and SICK

![Sign vocabularies for HAPPY and SICK](image)

HW’s mother continued to show some of the signs HW uses. The handshape for HAPPY (Figure 4.8(a)) and SICK (Figure 4.8(b)) are “B” and “middle finger-bent”. The sign vocabulary “HAPPY” was used with the correct facial expression. However, the facial expression for SICK was a little exaggerated. The body was not supposed to be bent when signing SICK. It is evident that HW saw someone who was sick and had this posture.

There were certain sign vocabularies that HW could not sign or fail to recall; therefore he would substitute these signs with similar semantic sign vocabulary. For instance, he would use CATCH for POLICE and SIT for CHAIR, as shown in Figure 4.9.
Figure 4.9: Substitutes for CHAIR and POLICE

HW substituted CHAIR (Figure 4.9(a)) with SIT (Figure 4.9(b)) when he wanted to use the sign for CHAIR.

HW substituted POLICE (Figure 4.9(c)) with CATCH (Figure 4.9(d)) when he wanted to use the sign for POLICE.

According to HW’s babysitter, he is just like other children with no hearing disabilities and is active. Sometimes, the babysitter would refer to a sign language book provided by his parents whenever she needed to have a simple conversation with HW. Although his exposure to sign language at the babysitter’s place is limited, he is still exposed to some signs. In other words, HW’s exposure to sign language is not limited to his home only.
4.1.3 Subject 3: NC

NC was 31 months old at the time of the interview. During the interview, it was noted that both parents’ sign language mastery was not as good as the other parents’ who are subjects of this research. They grew up in similar environments, using very simple sign language to communicate with their family members. When the interview was conducted, it was a struggle to make NC’s parents understand the questions and to answer appropriately (Refer to Appendix 2). For instance, when NC’s parents were asked “What caused NC’s deafness?”, his mother did not understand the question, hence the question was rephrased to “Were there any conditions/diseases that caused NC to become deaf?”. His mother responded, “What is disease?” The question had to be rephrased and elaborated to the parents repeatedly. A few examples of answers were provided so that they understood the context of the questions. His parents lacked social interaction and communication skills and it can be a serious problem to NC’s social interaction skills. NC hardly signed to his mother or Deaf sister during the interview.

NC was about 3 months old when the doctor confirmed that he lost his hearing ability. Yet, his mother did not initiate any home education with him. It was often noticed that his mother always tells NC’s 6-year-old Deaf sister to teach him some signs. His sister is too young to teach NC sign vocabulary properly. Nevertheless, his mother claims that she has tried to teach NC some sign vocabulary but gave up when she could not get his attention. As a consequence, today NC has very short attention span and could not pick up sign language. His mother even said that she would let NC pick up sign language on his own from his surroundings. However, NC would not be able to receive sufficient input from his surroundings because he can only learn it from deaf adults and not from television or newspaper. His parents are quiet people; they do not talk to each other.
Amongst his early vocabulary were TOILET, EAT and MILK, as shown in Figure 4.10. Although NC learnt these sign vocabularies, there was still insufficient input. According to his mother, she rarely sees NC signing, which implies that NC did not receive much input from his surrounding at home or at his babysitter’s house. The lack of exposure to sign language could retard NC’s sign language development. This is supported by NC’s babysitter’s comment about NC: “I did not communicate with him so much except when disciplining him on what he could and could not touch in the house.” and “NC did not communicate much with me even though he was the only child I was looking after.”

**Figure 4.10:** Sign vocabularies for TOILET, EAT and MILK

(a) ![Sign vocabulary for TOILET](image)
(b) ![Sign vocabulary for EAT](image)
(c) ![Sign vocabulary for MILK](image)

The sign vocabulary for TOILET (Figure 4.10(a)) was signed wrongly with the wrong handshape as demonstrated by NC’s mother (picture above). The correct sign uses the handshape “T” (❌) instead of “A” (⭕️). The sign vocabularies for EAT (Figure 4.10(b)) and MILK (Figure 4.10(c)) are correct. The facial expression shown is actually shown by NC.
4.1.4 Subject 4: JK

JK was 28 months old at the time of the interview. Her parents grew up in different settings; her father grew up using simple sign language to communicate with his paternal grandparents who brought him up. Her mother grew up with a good command of sign language as her grandmother was a teacher for Deaf students and knows sign language. Despite the difference between the degrees of exposure to sign language, JK’s parents have the same perspective on sign language and they actively use sign language in their daily lives. JK was one year old when she was first exposed to sign language. Due to JK’s heart problem, JK had to stay with her maternal grandmother instead of her parents since birth. JK often received sign language input from her grandmother while she was under her grandmother’s care. The language exposure was delayed because her parents and grandmother were not sure of her hearing condition until she was one year old.

Although JK experienced a delay in the acquisition of sign language; she has learnt the language quickly. With the grandmother’s ability in using sign language, JK was able to acquire sign vocabulary even though she was away from her parents. Amongst her first signs were FATHER, MOTHER, MILK and DEFECATE, as can be seen in Figure 4.11. According to her parents, JK did not understand the meaning of the FATHER and MOTHER signs. JK was confused, therefore, she signed FATHER to every man she saw and MOTHER to every woman she saw. This shows that her semantic understanding is that FATHER and MOTHER refer to man and woman respectively. After several times of being corrected, she finally understood what these signs are for. At the time of the data collection, JK could sign these sign vocabularies correctly already.
Figure 4.11: Sign vocabularies for FATHER, MOTHER, DEFECATE and MILK

Figure 4.11(a) and (b) show JK’s mother demonstrating the handshapes, movements and locations used for the sign vocabulary for FATHER and MOTHER respectively (from left to right) are correct.

The sign vocabulary for DEFECATE is correct, as demonstrated by JK’s grandmother in Figure 4.11(c). The sign vocabulary for MILK, as in Figure 4.11(d), is different from those signed by the other subjects in this research. JK used two hands to produce the sign MILK but the other subjects used only one hand. Nevertheless both sign versions for MILK are correct.

As part of JK’s process in acquiring sign language, it was reported that her mother and grandmother would read her books during bedtime. Yet, her grandmother and mother have not started any home education, just like HW’s mother. With the commitment that JK’s grandmother and mother have, their efforts were rewarded, because now, JK is
capable of making sentences comprising of more than one word, as shown in the Figure 4.12.

**Figure 4.12:** Sentence structure shown by JK

![Figure 4.12](image)

(a) FATHER   (b) WHERE

Translation: Where is father?

JK’s grandmother related one incident where JK was looking for her father when she woke up and found that her father was not around. Therefore, JK asked her mother where her father is.

Besides that, her mother used real objects while teaching JK. For example, she would take a ball out to show JK before signing BALL so that JK would understand and remember the sign as shown in Figure 4.13.

**Figure 4.13:** Sign vocabularies for BALL, TREE and HOUSE
Figures 4.13 (a) – (c) show the signs for BALL, TREE and HOUSE. These signs can be formed easily by Deaf children as the handshapes are not complex and the movement and location are not limited and can be freely signed.

It was also found that JK repeated some signs several times in different situations. JK often signed each object she saw when she was outside. For example, when she saw a tree and a house, she signed TREE and HOUSE respectively as in Figure 4.13. She would keep signing TREE if she saw another tree and HOUSE if she saw another HOUSE. It is a part of her learning process – the sign vocabulary could be sustained through repetition. Repetition of sign vocabulary will help JK remember the sign vocabulary she is learning.

4.2 Findings from the Observations

The purpose of these observations is to find out how the children responded, in terms of their expressive and receptive responses. Expressive response requires children to produce signs using sign language on their own while receptive response prompts children to perform some actions as responses to the questions asked in sign language by people around them such as their mothers. Three observations were carried out for each child at three different places i.e. home, church and shopping areas. The observations for each child were carried out once a week for three consecutive weeks, i.e. at home in the first week, then church in the following week and lastly shopping centre in the third week. During these observations, the vocabulary signs that the children have produced to express their feelings, concerns, confusions and thoughts and also their responses to adults’ questions were captured.
4.2.1 Subject 1: AE

The observation sessions on AE revealed that his receptive responses in sign language were limited as indicated by his general inability to respond to the simple questions that his mother asked, for example, his mother asked “what is this?” and pointed at a toy car as in Appendix 6 Event 6 (under AE observation report), expecting AE to respond. He either ignored her questions or looked elsewhere as shown in Event 2. In Event 2, his mother tried to ask him whether the sweet AE was eating was delicious, and she was totally ignored and AE changed the direction of the conversation by pointing at something else, in this case, he pointed at a vehicle outside his house. It was also found that sometimes AE responded to his mother by copying her signs, which means AE was repeating the same sign after his mother. This can be seen in Event 3, where AE signed COLOUR and PHONE after his mother. The sign vocabularies he expressed have some handshape errors, as shown in Figure 4.14. It was often noticed that although his mother was aware of the handshape errors, she did not make an effort to correct it. Hence, AE kept using wrong handshapes every time he tried to converse with his father, and this made the father struggle to understand him, as reported by his mother in the interview.

Figure 4.14: AE copies his mother for COLOUR and PHONE

![Figure 4.14](image)
Figure 4.14(a) and (b) show the sign vocabulary for COLOUR and PHONE. In Figure 4.14(a), AE’s mother showed the correct handshape for COLOUR which is “5” (空前) and wiggling it, but AE showed a different handshape where the fingers were clenched into a fist. In Figure 4.14b, AE did not show the same handshape “Y” (空前) like his mother’s.

During the observation, it was noticed that AE repeated the sign vocabulary of another person whom he met for the first time, as shown in Figure 4.15. This incident showed that AE is friendly to people around him, even to a new person. Unfortunately, he was unable to express himself in sign language and this is not because he is shy, but because he is used to receiving sign vocabularies more than expressing in sign language himself.

**Figure 4.15: AE initiating the sign vocabulary for AEROSOL**

![AE initiating the sign vocabulary for AEROSOL](image)

The image shows AE imitating the sign AEROSOL that was demonstrated by a new friend. He correctly imitated the handshape of “X” (空前).

Also, it was rare to see AE producing different sign vocabularies as a response to his mother or other people’s simple questions as shown in Event 9. In this event, the researcher simply made a handshape of “1” (空前) as a request for a sweet from AE and AE immediately gave the researcher the sweet and then produced the sign THANK-YOU spontaneously as in Figure 4.16. According to his mother, AE often asked for...
money when they were going to pass through a toll station. AE would produce the sign THANK-YOU after he has handed the money to the toll collector.

**Figure 4.16:** A request by the researcher for a sweet from AE

![Figure 4.16(a)](image1)

![Figure 4.16(b)](image2)

Figure 4.16(a) shows the handshape of “1” (၁), made by the researcher while Figure 4.16(b) shows that AE made a handshape under his chin to show the sign vocabulary THANK-YOU.

**4.2.2 Subject 2: HW**

The observation revealed that HW could express himself using sign language when conversing with his parents and other signers (i.e. people who know sign language). HW was able to respond when his father asked for the sign vocabularies for the pictures he pointed in a book as in **Figure 4.17**.

**Figure 4.17:** HW responding his father’s instruction for LION and GIRAFFE

![Figure 4.17(a)](image3)

![Figure 4.17(b)](image4)
Figure 4.17(a) and (b) shows HW signing LION and GIRAFFE respectively, after following his father’s instructions. The sign for LION that HW produced was exaggerated a little as only one hand is required to produce the sign and the sign vocabulary does not require the signer to grip the forehead with fingers and move the fingers through the hair to the back of the head. The sign GIRAFFE was signed correctly as the handshape C is moved from down to up his neck.

HW knew the signs of each animal shown in the book however there were some movement or handshape errors. The errors, which HW made for the signs RHINOCEROS, ELEPHANT and RABBIT, are shown in Figure 4.18.

**Figure 4.18: Phonological errors for RHINOCEROS, ELEPHANT and RABBIT**

Figures 4.18 (a) – (c) show HW expressing the signs for RHINOCEROS, ELEPHANT and RABBIT respectively. The error in Figure 4.18(a) is the handshape, where it should be “Y” (/thumb) instead of “A” (fingers). The sign ELEPHANT has location error, because HW started the sign in front of his chest instead of his nose. The sign RABBIT also has a handshape error, because his left hand was showing the handshape “1” (thumb) instead of “U” (index and middle fingers).

HW did not sign ZEBRA properly. The sign for ZEBRA requires a combination of two sign vocabularies which are HORSE and STRIPE as shown in Figure 4.19. He signed
only HORSE. His father corrected HW’s sign for ZEBRA by adding the sign STRIPE and then HW repeated the sign STRIPE which he missed.

**Figure 4.19:** Two combination of signs HORSE and STRIPE

![Figure 4.19](image)

Figure 4.19 (a) and (b) show the signs HORSE and STRIPE respectively. Combination of these signs indicates ZEBRA. When HW signed ZEBRA, he only signed the first sign (HORSE) and his father corrected him by adding the second sign (STRIPE).

The signs for animals which HW signed correctly are TIGER, PENGUIN, MONKEY, CROCODILE, DOLPHIN, DEER and BEAR which can be seen in **Figure 4.20**. This shows that HW could recall most of the animal signs correctly and also confirms his father’s claim that HW has a very good memory and is able to recall the signs his mother has taught him. It was observed that HW could sign the 13 different animal signs within 70 seconds without any hesitation.
Figure 4.20: HW signing for animals

Figure 4.20(a) – (g) shows 7 sign vocabularies for animals, TIGER, PENGUIN, MONKEY, CROCODILE, DOLPHIN, DEER and BEAR (from left to right).

Not only could HW identify the pictures in the book, he was also able to identify other objects such as banana, apple and orange as can be seen in Figure 4.21.

Figure 4.21: HW signing for fruits
HW showed signs for BANANA, APPLE and ORANGE in Figures 4.21(a), (b) and (c) respectively. He has signed apple and orange correctly but the wrong handshape was used for banana, he should have used the handshape “A” ( ) instead of “S” ( )..

The observation also revealed that HW was capable of responding receptively besides responding expressively. HW was able to point correctly at the pictures when his father signed their sign vocabulary, as can be seen in Figure 4.22.

**Figure 4.22: HW responding to his father**

![a](image1) ![b](image2) ![c](image3)

The set of images in Figure 4.22 shows in chronological order how HW responded receptively to his father for the sign BISCUIT. In the first image, his father signs BISCUIT and HW studies it. His father kept signing BISCUIT for a little longer until HW finally knows the sign. In the second image, HW signs BISCUIT by repeating after his father, and then starts to look for the picture in the book that matches the sign vocabulary BISCUIT. In the last image, he sees the picture of a biscuit in his picture book and points at it. This indicates that HW has the correct understanding of the sign BISCUIT.

There was one incident where his father teased him by pointing at his mother and signing FATHER instead. HW responded by pointing at his father instead, indicating that he understood the actual meaning of the word, as can be seen in Figure 4.23. It shows that HW was receptive and could identify and interpret the meaning of the sign vocabularies that he saw. He could also answer his parents’ questions about other family
members, by producing the correct signs. HW’s answers were correct and not out of context.

**Figure 4.23:** Conversation between HW and his parents

![Conversation between HW and his parents](image)

The set of images in Figure 4.23 shows a conversation between HW and his parents. His mother was sitting at the dining table while his father was sitting on the floor with HW. His father asks HW a question by signing FATHER in the second image and THERE in the third image. (Translation: Is that person your father?) He repeats the same signs in the fourth and fifth images so that HW understands the question. In the last image, HW quickly responded by poking his father to show that this is FATHER.

**Figure 4.24** shows the conversation that HW had with his parents. From the conversation, it is obvious that HW understood his parents’ questions and was able to answer the questions correctly. He even signed WORK and HOUSE correctly.

**Figure 4.24:** Dialogue between HW and his parents

*Father: FATHER WHERE (where is father?)*  
*HW: (pointing at Father)*  
*Father: MOTHER WHERE (where is mother?)*  
*HW: (pointing at Mother)*
Father: FRIEND (pointing at the researcher)
HW: (pointing at ‘Friend’ repeating what his father did)
Father: JC (sign name)
HW: (pointing at himself)

......

Father: GRANDFATHER WHERE (Where is grandfather?)
HW: WORK (Grandfather is working)
Father: GRANDMOTHER WHERE (Where is grandmother?)
HW: (pointing outside the door) HOUSE (Grandmother is in the opposite house)

Mother: L (certain member’s sign name) WHERE? (Where is L?)
HW: (pointing outside the door)
Father explains that L has gone out to a friend’s house.

......

Father: FRIEND WHERE? (Where is Friend?)
HW: (pointing at the researcher)

It was also found that HW is capable of making two-word questions as in Figure 4.25. HW often initiates a simple conversation with his mother by asking a question. According to his mother (Example 4.6 in Interview Report) HW has asked her some two-word questions. These examples show that HW has the ability of recalling correct signs for the conversations and also shows that he has sufficient sign vocabulary input appropriate for his age.

**Figure 4.25:** Conversation between HW and his mother

The three images in Figure 4.25 show that HW took the initiative first by asking his mother a question. In the first image HW can be seen patting his mother’s hand to get her attention, then the last two images (the images can be viewed clearer in the video), show HW signing FRIEND WHERE (Where is Friend?).

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The next three images show that HW is not satisfied with his mother’s response to his question after his mother signed that the friend is at the next row of shelves. HW wanted to search for the ‘friend’ so he asked his mother to push the trolley to the direction he wanted. When his mother followed his instructions, HW suddenly saw the ‘friend’, and pointed at the researcher. The mother realised that the friend her son meant was actually the researcher.

4.2.3 Subject 3: NC

The observation sessions with NC revealed that his receptive responses in sign language are poor, as indicated by his inability to respond correctly to simple questions that his mother asked. For example, when his mother asked him “what is this?” and pointed at a picture of a dog in a book, as shown in Figure 4.26, NC was looking at the picture blankly and only responded after his mother signed DOG. This showed that NC was trying to copy his mother’s signs.

Figure 4.26: NC’s mother showing sign vocabulary DOG
Figure 4.26(a) shows NC looking at a picture of a dog in a book. He did not produce any sign vocabulary, until his mother signed DOG as in Figure 4.26(b), then only he tried to imitate her however he failed to sign correctly.

An incident with his 6-year-old sister also showed that NC was simply copying his sister, i.e. signing the sign vocabulary after his sister, as in Figure 4.27. It was also found that NC’s mother was unable to make him sit still and pay attention to her. She could not get NC to engage in any form of communication, even for a minute.

**Figure 4.27:** Handshape shown by NC and his sister for COW

![Handshape shown by NC and his sister for COW](Image)

Figure 4.27(a) shows NC’s sister signing COW. She has signed correctly; however, NC used the wrong handshape (Figure 4.27(b)). He showed the handshape “E” ( ) instead of “Y” ( ). It may indicate that NC is not ready for the sign language acquisition.

This also suggested that NC has a very short attention span, as shown in Figure 4.28, and also he has not got any effective form of home education with his parents.
**Figure 4.28:** NC’s sister failing to engage NC

![Figure 4.28](image)

The set of images in Figure 4.28 shows how NC totally ignored his sister although she kept signing the sign vocabularies for the animals in the book.

**Figure 4.29** reveals that NC’s mother is not using effective methods or ways to teach him. Instead of signing MONKEY in front of him, she signed behind him and he could not see it. If this situation continues, NC would not be able to learn sign vocabulary from his mother. His mother should have signed MONKEY and repeated the sign vocabulary in front of him so that NC could see it. The method his mother used is not effective as such NC will not benefit from the learning sessions.

**Figure 4.29** reveals that NC’s mother is not using effective methods or ways to teach him. Instead of signing MONKEY in front of him, she signed behind him and he could not see it. If this situation continues, NC would not be able to learn sign vocabulary from his mother. His mother should have signed MONKEY and repeated the sign vocabulary in front of him so that NC could see it. The method his mother used is not effective as such NC will not benefit from the learning sessions.

**Figure 4.29: Mother signing MONKEY, away from NC’s line of sight**

![Figure 4.29](image)

The set of images in Figure 4.29 shows in chronological order how NC responded expressively to his mother for the sign MONKEY. In the first image, his mother pointed at a picture of a monkey, then in the next image, his mother signed MONKEY and the last image shows how his mother forced NC to sign MONKEY by clutching his hand and making him sign MONKEY. His mother should have signed MONKEY and
repeated the sign vocabulary in front of him so that NC could see it. The method his mother used is not effective as such NC will not benefit from the learning sessions.

During the observation, it was noticed that NC did not respond to his mother's instructions to sit down or to be quiet as in Appendix 6 Events 4 and 5 (under NC observation report). NC either ignored his mother’s instructions or did not understand what she was saying. It was rare to see NC expressing himself, i.e. producing sign vocabulary by himself. The only sign vocabularies that NC has produced by himself during the observation sessions were LION and TOILET, as shown in Figure 4.30.

**Figure 4.30:** NC expressing sign vocabularies by himself

![Figure 4.30(a): LION](image1)

![Figure 4.30(b): TOILET](image2)

Figure 4.30(a) shows one of the sign vocabularies that NC has expressed by himself, which is LION. NC has used correct phonologies (handshape, movement, location and palm orientation). However, the sign TOILET shown in Figure 4.30(b) has one phonological error, which is the handshape. NC used handshape “A” ( ![a_handshape](image3) ) instead of “T” ( ![t_handshape](image4) ).
4.2.4 Subject 4: JK

The observation sessions revealed that JK could express herself using sign language when conversing with her parents and other signers (i.e. people who know sign language). JK was able to produce sign vocabulary for BOAT when she saw an image of a boat on the desktop screen, as in Figure 4.31. JK was also able to respond appropriately when her mother asked her to sit in front of a small table, as described in Appendix 6 Event 1 (under JK observation report). JK understands her mother’s instructions for her to sit on a chair.

**Figure 4.31: JK signing BOAT by herself**

![Image of JK signing BOAT](image)

Figure 4.31 shows JK looking at an image of a boat in the computer screen and later signs BOAT by herself. However, the handshape she used is slightly wrong. She should have used handshape “B” (ꞌ) but instead she used handshape “5” (ꞌ). JK was able to respond when her mother asked her the sign vocabularies for fish and flower which her mother drew on a mini whiteboard as shown in Figure 4.32. JK was able to produce the sign vocabularies for the things her mother drew even though the drawings were not clear, this indicates that J could identify flowers and fish even if they differ in shape, colour and size. Prior to the drawing incident, her mother attempted to get JK to produce sign vocabularies for a picture of a ball and an apple in a book but
failed. JK declined to produce the sign vocabularies even though her mother showed the sign vocabularies to her, so that she could copy her mother. Perhaps JK chose to keep quiet or felt shy at this time.

**Figure 4.32:** Sign vocabularies for FISH and FLOWER

![Figure 4.32](image)

Figure 4.32 shows JK signing (a) FISH and (b) FLOWER after her mother drew a fish and flower on the mini whiteboard. The sign phonology, i.e. handshapes (ですね、ですね), locations (chest, cheek), movements (non-movement, arc), and palm orientations (backward, backward) for both FISH and FLOWER respectively are all correct.

In another incident where JK played with fruit puzzles, she produced the sign vocabularies for APPLE and BANANA correctly after she completed the puzzles, as in **Figure 4.33**.

**Figure 4.33:** JK signing for fruits after completing puzzles

![Figure 4.33](image)
Figure 4.33 shows JK signing (a) APPLE and (b) BANANA once she has completed the fruit puzzles. The sign phonologies for both apple and banana are correct.

However, she could not sign for PINEAPPLE and MANGO. Hence, her mother showed the sign vocabularies to her as in Figure 4.34, and her mother repeated the same sign vocabularies so that JK becomes aware of the signs.

**Figure 4.34: Mother teaching sign vocabularies for fruits**

![Figure 4.34](image)

Figure 4.34 shows JK’s mother teaching her the sign vocabularies for (a) PINEAPPLE and (b) MANGO after which JK just looked at her mother without signing, indicating that she has forgotten the sign vocabularies, or it could be that she was too groggy to sign it. Her mother repeated the sign vocabularies so that she saw them as her mother taught her.

It was also found that JK is capable of making two-word sentences as shown in Figure 4.35. JK developed a sentence while looking at her mother to say that the box was not covered properly. It is possible that JK knows that in order to converse with her mother, eye contact is crucial therefore, before she made the sentence, she would look at her mother first, and then only produce the intended sentence. This situation confirmed her grandmother’s statement that she is able to make two-word sentences.
The set of images in Figure 4.35 shows JK struggling to cover the box properly. JK looks at her mother and signs INDEX CLOSE CLOSE (shaking head) which can be translated as “This box cannot be closed properly.” In the last image, she was glad that she completed the task. However, the handshape for CLOSE is not correct, as she used the handshape “S” ( 🖐️ ) instead of “B” ( 🖐️ ). The wrong handshape for CLOSE was not meaningful.

In another incident she signed MOTHER, as shown in Figure 4.36, when she saw the image of her mother on a camcorder’s screen, and this confirmed her mother’s statement that JK will sign any objects she saw. In the same Figure 4.36, JK signed HAT immediately after she saw the image of a hat on a mini book.
**Figure 4.36:** Sign vocabularies for HAT and MOTHER

![Figure 4.36(a)](image_a) ![Figure 4.36(b)](image_b)

Figure 4.36(a) shows the sign for HAT that JK produced immediately after she saw the picture of a HAT on a mini book. The phonologies for the sign HAT are correct. Figure 4.36(b) shows the sign MOTHER that JK produced after she saw the face of her mother on the camcorder’s screen. The phonologies JK showed for the sign MOTHER are perfect.

### 4.3 Analysis of Recorded Activity Sessions

There were five learning activities that were carried out by an Early Intervention Programme (EIP) worker each lasting about 40 minutes, namely “putting round chips into board columns”, “matching picture to picture”, “animal farm”, “cutting and cooking” and “reading *Jovi*”. These learning activities aim to expose the subjects to a total of 29 sign vocabularies which enable the subjects to name the existing objects used in the five learning activities. It is difficult to determine what sign vocabularies the subjects have or have not learnt before they were involved in these learning activities. Some of them may have already learnt some sign vocabularies from other people around them besides their parents. Therefore, it was not surprising that some of them already knew some of the signs used in the learning activities. The purpose of this
research is to determine the level of the sign language that the subjects have acquired. This will be determined during the learning sessions.

The focus is on the responses that the subjects have shown in each learning session. Responses here refer to the sign language and actions the subjects are expected to show expressively and receptively. Through these responses, sign phonology errors made by the subjects were noted and analyzed, however, as it is not the main focus of the research, it will not be discussed in detail. Meanwhile, signs that the subjects used during the learning session that are not among the targeted 29 sign vocabularies were also recorded. The sign vocabularies that are not among the targeted 19 sign vocabularies which were either used as a single sign or in a form of two-word sentences were recorded as well. This acts as an aid to determine the subject’s mastery of language.

This section also includes the amount and level of sign vocabularies the children have expressed by themselves prior to the learning activity sessions. Details on amount of sign vocabularies that the children are able to recall will be a great contribution to the analysis, i.e. how much the children understand abstract words, and to what extent the amount of sign vocabulary input influence the children’s level of receptive and expressive skills. As for this case, all the sign vocabularies that their parents taught them were recorded and classified into six different categories, which has been taken from Nelson (1973) vocabulary classification, and cited in Hoff (2009):

(1) specific nominals, such as Daddy, Mother;

(2) general nominals, such as dog, cat;

(3) action words, such as eat, run;
(4) modifiers, such as *big, mine*;
(5) personal social words, such as *no, please; and*
(6) grammatical function words, such as *what, for.*

4.3.1 **Subject 1: AE**

The interview with AE’s mother revealed that AE could only express 13 sign vocabularies prior to the learning activity sessions as in Appendix 7. The learning activity sessions with AE revealed that both of his receptive and expressive responses in sign language were limited.

In all sessions, during the activity “Putting round chips into board columns”, AE was not able to respond to the EIP worker's simple question, “What is the colour?” (by signing COLOUR WHAT) . He could not produce sign vocabularies for GREEN and PURPLE. However, after the EIP worker signed GREEN, he copied the sign as can be seen in Figure 4.37. The same occurrence (copying the sign produced by the worker) happened four times in the first session, once in the second session and nothing in the third or last session. It was also noticed that although the EIP worker signed GREEN more than 20 times, AE only attempted to copy and repeat the sign less than five times whereas for PURPLE, AE only copied and repeated the sign twice. In both instances, the EIP worker kept repeating the signs of the colours, hoping that AE would notice it and repeat after her.
Figure 4.37: Sign vocabulary GREEN by AE

The image shows how AE forms the sign GREEN after the EIP worker. The EIP worker produced the handshape “H” (Gesture A) to form GREEN, but AE made a different handshape which is “B” (Gesture B), however the movement of the handshape for GREEN is correct.

In the first session, during the activity “Matching picture to picture”, AE was able to produce the sign vocabulary for TOMATO twice, one of the target sign vocabularies for the activity (BURGER, TOMATO, SOUP and JELLY), as shown in Figure 4.38(g). However, in the same session, the handshape, movement and location that AE produced for the vocabularies JELLY and SOUP were wrong, as in Figures 4.38(a) and (c) although he attempted to copy the signs produced by the EIP worker. The sign vocabulary that AE produced for BURGER was wrong even after he watched the EIP worker's sign and tried to copy it, as in Figure 4.38(e). This shows that he failed to observe the signs produced by the EIP worker properly due to his short attention span and lack of home education. In the second session, AE only imitated the sign for BURGER after the worker signed it. There was no further improvement in both the second and third sessions.
The sign vocabulary for JELLY that AE had produced was wrong, as in Figure 4.38(a) and it should be signed as shown in Figure 4.38(b), i.e. form the handshape “C” ( ) using one hand and move the handshape on the palm of the other hand.

The sign vocabulary for SOUP that AE had produced was wrong, as in Figure 4.38(c) and it should be signed like the sign shown in Figure 4.38(d), i.e. form the handshape “T” ( ) in one hand and move the hand towards the mouth.
The sign vocabulary for BURGER that AE had produced was almost accurate, as he was only using one hand and grasped his chin as seen in Figure 4.38(e). It should be signed as shown in Figure 4.38(f), i.e. each hand forms the handshape “C” ( ) and act like as if you are eating a burger.

The sign vocabulary for TOMATO that AE had produced was correct, as in Figure 4.38(g) and is the same as the correct sign shown in Figure 4.38(h). The handshape, location and movement that AE produced to make the sign TOMATO were correct.

In all the sessions, during the activity “Animal Farm”, AE was unable to express the nine targeted sign vocabularies to the worker. In the first session, he only managed to copy the signs for CHICKEN, SHEEP, COW, HORSE, GOAT and DUCK from the worker. However, it was noticed that these sign vocabularies were formed with phonological errors, mainly handshape. For example, when AE produced the sign for GOAT, he would use handshape “C” ( ) instead of handshape “V” ( ) on his forehead as in Figure 4.39. He also could not form the handshape “H” ( ) and “Y” ( ) for HORSE and COW respectively, as shown in Figure 4.39. These situations show that AE had not practiced forming proper handshapes on a daily basis as AE often looked at his hands when trying to form the handshapes. In the second session, the same
occurrence happened where he failed to form correct handshapes as a result of lacking language learning at home for the same sign vocabularies he learnt in the first session.

There was no further improvement in the last session.

**Figure 4.39: Responses in “animal farm” activity**

The sign vocabulary for HORSE that AE had produced was wrong because he formed the wrong handshape which can be seen in Figure 4.39(a). AE should have produced the handshape “H” ( )); as in Figure 4.39(b).

The sign vocabulary for COW that AE had produced was wrong because of the wrong handshape “O” ( ); which can be seen in Figure 4.39(c). AE should have produced the handshape “Y” ( ) in Figure 4.39(d).
The sign vocabulary for GOAT requires two different handshapes. The first handshape “C” (estruction (m) that AE had produced was correct, but the second handshape “C” (estruction (m) was wrong, it should have been “V” (estruction (m) as shown in Figure 4.39(f).

The handshape for the sign vocabulary for DUCK that AE formed was correct as in Figure 4.39(g), however, the position of the handshape was not right. The handshape should be placed near the mouth, as in Figure 4.39(h).

As for the activities “Cutting and Cooking” and “Reading Jovi” in all three sessions, AE did not show that he was capable of producing the 13 targeted sign vocabularies. Meanwhile, AE has imitated some signs produced by the worker which are not among targeted sign vocabularies, i.e. TREE, TAIL and FATHER as can be seen in Table 4.1. AE has showed the correct handshapes for all non-targeted sign vocabularies as in Table 4.1 except for FATHER, by using “A” (estruction (m) instead of “B” (estruction (m)).
Table 4.1: Collection of non-targeted sign vocabulary in the sessions

<table>
<thead>
<tr>
<th></th>
<th>First session</th>
<th>Second session</th>
<th>Third session</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE signs after</td>
<td>AE signs after the worker – tree,</td>
<td>AE signs after the worker –</td>
<td>AE signs after the worker –</td>
</tr>
<tr>
<td>the worker</td>
<td>tail, father</td>
<td>colour</td>
<td>tree</td>
</tr>
</tbody>
</table>

Table 4.2 shows the AE's repeated responses in all the sessions, i.e. how many times AE has produced sign vocabularies, with or without errors, show how much AE has followed the worker’s instructions and the occurrence of imitating the worker.

Table 4.2: Occurrence of the responses in the sessions

<table>
<thead>
<tr>
<th>Responses according to the tasks (the worker’s instruction)</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide the correct response (sign)</td>
<td>2</td>
<td>2</td>
<td>nil</td>
</tr>
<tr>
<td>Perform the right action</td>
<td>nil</td>
<td>nil</td>
<td>2</td>
</tr>
<tr>
<td>Imitate the worker’s sign vocabulary</td>
<td>11</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

The result is parallel with AE’s mother’s description on AE’s expressive and receptive skills. The result of the sessions clearly shows that AE has not acquired many sign vocabularies from the sessions as he could not even form the right handshape for many of the sign vocabularies.

From the results of the learning activities that AE has gone through, it was observed that he has very short attention span and the worker's attempts to make him sit still and pay attention was not very successful. The worker had difficulties to get AE to sign on his own. Although his mother was there with them during the learning sessions, she was unable to get AE to sign. Most of the signs AE showed did not have proper handshapes. This indicates that AE could only use gestures to communicate and follow the EIP worker's instructions.
4.3.2 Subject 2: HW

The interview report with HW’s mother revealed that HW could produce as many as 97 sign vocabularies, as in Appendix 7 prior to the learning activity sessions. The learning activity sessions with HW revealed that both his receptive and expressive responses in sign language were good and he was the best amongst the other subjects of the research.

In the first session during the activity “Putting round chips into board columns”, HW was able to express by himself the target sign vocabularies for GREEN and PURPLE, as seen in Figure 4.40.

Figure 4.40: Sign vocabulary GREEN and PURPLE by HW

Figure 4.40(a) and (b) show how HW forms the sign vocabularies GREEN and PURPLE respectively. The handshape “G” ( לכ ) for the sign vocabulary GREEN that HW formed was correct. HW made handshape “V” ( כב ) for the sign vocabulary PURPLE where he should have made the handshape in the form of “P” ( יפ ). Both of the handshapes “V” and “P” are distinguished by the thumb. It could be that HW was confused with the handshape, hence he made handshape error when producing the sign vocabulary PURPLE.
In Figure 4.40, he had signed GREEN three times and PURPLE seven times in the first session only. However, he never responded to the EIP worker in the same activity during the second and third session. It was learnt that HW had actually learned the vocabulary from his parents; therefore, he did not want to sign GREEN and PURPLE over and over again. In the last session, it was found that HW understood the worker's instructions (by taking the green chips as a response to her instruction “I want the green chips” by signing WANT GREEN). Besides that, it was surprising to see that he did not imitate the worker’s sign for GREEN and PURPLE in the all the sessions. The response that HW showed during the time when the worker gave instructions indicated that he could understand the signs produced by the worker.

In the activity “Matching picture to picture” in the all three sessions, HW was able to express by himself the sign vocabularies for TOMATO, SOUP, JELLY and BURGER as in Figure 4.41. These sign vocabularies were new to HW and were taught for the first time in the first session. After the EIP worker taught the sign vocabularies to HW, HW was able to recall them quickly in the following sessions. There was one incident where HW could not recall the sign vocabulary for JELLY correctly, which is shown in Figure 4.42; however, he was able to sign it correctly after the worker repeated the sign vocabulary. HW imitated all the new sign vocabularies after the worker in the first session except JELLY; he imitated the sign vocabulary for JELLY in the second and third session. As compared to the first activity “Putting round chips into board columns” where HW never repeated the signs for GREEN and PURPLE as he already knew them, he was more than willing to imitate the sign vocabularies for new signs that he has never learnt before as shown in Figure 4.41 and repeated the sign vocabulary for JELLY only in the last two sessions. JELLY is the sign vocabulary that HW struggled to remember. It could be that he could not identify the image of JELLY which was a lot
like to ship image, as in the first session, it prompted him to sign SHIP instead of JELLY. From these we can conclude that imitation is part of HW’s learning process and it is only applied when learning new vocabularies. HW could also choose the correct pictures the worker asked him to. This is a sign that he understood the worker’s instructions and this was observed during the second and third sessions.

**Figure 4.41: Responses in “matching picture to picture” activity**

![Figure 4.41](image)

The sign vocabulary for TOMATO and SOUP that HW produced had correct phonologies i.e. handshape, location and movement, as shown in Figure 4.41(a) and (b) respectively.

![Figure 4.41](image)
The sign vocabulary for JELLY and BURGER that HW produced had correct phonologies i.e. handshape, location and movement, as in Figure 4.41(c) and (d) respectively.

**Figure 4.42:** HW signing SHIP and TOMATO for jelly

(a)   (b)

The sign shown in Figure 4.42(a) and (b) are actually referring to SHIP and TOMATO respectively. HW showed these signs when he was prompted to sign JELLY.

In the activity “Animal Farm”, HW was able to express by himself the 9 targeted sign vocabularies, as shown in **Figure 4.43**. During the first session, he could not sign SHEEP, GOAT, MAN and DUCK. However, he produced these sign vocabularies correctly in the second and last sessions. It was also found that he imitated the signs for SHEEP, CAR, COW, APPLE and MAN in the first session, and the worker had to repeat the sign MAN in the second session and COW in the last session. The first and second session revealed that HW was able to pick the correct pictures of animals that the worker asked for. For example, when the worker signed COW, HW immediately picked up the corresponding picture. When the worker showed the objects of chicken, car, cow, horse and apple for first time, HW expressed by himself the corresponding signs vocabularies correctly and his mother confirmed that she has already taught him these signs. In the second session, HW made a question APPLE WHERE (Translation:
Where is the apple?) when he realised that there was no picture of an apple (HW saw the picture of an apple in the first session). It was once again noted that he was able to make two-word sentences. This incident showed that he has learnt many sign vocabularies through home education as mentioned by his mother during the interview session.

**Figure 4.43: Responses in “animal farm” activity**

Figure 4.43(a) and (b) show the sign vocabulary for CHICKEN and CAR. The sign vocabularies shown have correct phonologies. When HW signed CAR, he acted like as if he was driving attentively.

Figure 4.43(c) and (d) show the sign vocabulary of COW and SHEEP. HW made a handshape error for COW. The correct handshape should have been “Y” (ᄀ) instead of “A” (ᄂ). The location for the sign SHEEP should be on the forearm instead of arm.
Figure 4.43(e) and (f) show the sign vocabulary for GOAT and DUCK. The first handshape for GOAT should be “C” ( ) instead of “V” ( ). The sign for DUCK has correct phonologies.

Figure 4.43(g) and (h) show the sign vocabulary for HORSE and MAN. The sign vocabularies shown have correct phonologies. When HW signed HORSE, he acted as if he was riding a horse.
Figure 4.43(i) shows the sign vocabulary for APPLE. The sign vocabulary shown has correct phonologies.

For the activity “Cutting and Cooking”, HW only managed to produce 5 out of the 11 targeted sign vocabularies and they are CABBAGE, EGG, SPOON, FORK and KNIFE mainly in the first session. He could not sign BREAD, TOMATO, CORN, ONION, PLATE and CHESS but imitated them after seeing the signs produced by the worker. There was no response from HW to the worker’s instruction in the last activity “Reading *Jovi*”. Meanwhile, HW could imitate the sign vocabularies which are not targeted sign vocabularies, i.e. TREE, GRASS and FATHER as can be seen in Table 4.3.

**Table 4.3: Collection of non-targeted sign vocabulary in the sessions**

<table>
<thead>
<tr>
<th></th>
<th>First session</th>
<th>Second session</th>
<th>Third session</th>
</tr>
</thead>
<tbody>
<tr>
<td>HW signs after the worker –</td>
<td>grass, tree</td>
<td>HW signs after the worker – hearing aids, tail, cloud, house</td>
<td>HW signs after the worker – brown</td>
</tr>
<tr>
<td>HW answers (sign vocabulary) –</td>
<td>orange, black, white, brown, grandmother, father, mother, bird</td>
<td>HW answers (sign vocabulary) – brown, tree</td>
<td>HW shows actions – house, tree</td>
</tr>
</tbody>
</table>

**Table 4.4** shows the occurrence of the responses in all the sessions, i.e. how many times HW has produced sign vocabularies, with or without errors, how much HW has followed the worker’s instructions and the occurrence of imitating the worker.

**Table 4.4: Occurrence of the responses in the sessions**

<table>
<thead>
<tr>
<th>Responses according to the tasks (the worker’s instruction)</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide the correct response (sign)</td>
<td>26</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Perform the right action</td>
<td>15</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td>Imitate the worker’s sign vocabulary</td>
<td>11</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>
The occurrences are parallel with HW’s mother’s description of HW’s expressive and receptive skills. The result of the sessions with HW clearly shows that HW has acquired many sign vocabularies and the sessions have been effective.

From the observation of the learning activities that HW participated in, it can be concluded that he has the ability to remember and recall new signs. He is a fast learner and one can notice that after teaching him the tasks or sign vocabularies in the first sessions, he was able to remember the tasks and sign vocabularies in the next 2 sessions. He could also sign the names of animals, colours and objects that have been taught by his mother. His mother has put in a lot of effort to teach him and as a result, he could respond well during the sessions. However, at times he did respond wrongly especially when he is not familiar with the signs that the worker has produced. The worker had used longer sentences to interact with him compared to other subjects in this research. HW was not able to respond to the longer sentences well, as it was noticed that sometimes, he misunderstood the complicated sentences as instructions.

4.3.3 Subject 3: NC

The interview with NC’s mother revealed that NC has expressed only 8 sign vocabularies, as in Appendix 7 prior to the learning activity sessions. The learning activity sessions with NC revealed that both of his receptive and expressive responses in sign language were insufficient.

In the activity “Putting round chips into board columns” for all the sessions, NC was unable to sign GREEN and PURPLE as a response to the EIP worker’s simple questions
“What is the colour?” (by signing COLOUR WHAT). He did not even imitate the worker’s signs for GREEN and PURPLE.

In the activity “Matching picture to picture” for all the sessions, NC did not produce sign vocabularies for BURGER, TOMATO, SOUP and JELLY. In the third session, he signed only TOMATO and JELLY as a result of imitating the EIP worker, as in Figure 4.44. As for receptive skill levels, it was found that NC understood the worker’s request by picking the burger, tomato, soup and jelly images correctly in the second and third sessions.

**Figure 4.44:** Responses in “matching picture to picture” activity

![Figure 4.44(a) and (b)](image)

Figure 4.44(a) and (b) show NC imitating sign vocabularies for JELLY and TOMATO respectively. Phonologies for JELLY were correct. NC should have put the handshape for TOMATO on both cheeks instead of just one as shown in Figure 4.44(b).

In the “Animal Farm” activity NC was able to express by himself 5 out of the 9 targeted sign vocabularies, which were CHICKEN, COW, HORSE, GOAT and MAN. In the first session, he could sign GOAT but the sign vocabulary was not completely formed, as shown in **Figure 4.45**. It was noticed that NC used the same sign (GOAT – not
completely formed) for SHEEP and COW. It indicated that NC did not understand that the sign vocabulary for GOAT is different from the sign vocabulary for SHEEP and COW.

**Figure 4.45:** Handshape of GOAT expressed by NC

![Handshapes](image)

The sign vocabulary for GOAT requires two different handshapes to form a sign vocabulary GOAT. The first handshape “C” (odega) that NC has produced is correct (Figure 4.45(a)), however, NC did not show the second handshape “V” ( workforce) as seen in Figure 4.45(b). Therefore, his sign for GOAT is not complete.

In the following sessions, he expressed the sign vocabularies for CHICKEN, COW, HORSE, GOAT and MAN, and some of them can be seen in **Figure 4.46**. These signs were responses to the worker’s requests, i.e. NC signed CHICKEN for the object that the worker was holding. However, there were handshape errors in each of the sign vocabularies which he produced by himself, as in **Figure 4.46**. It showed that he did not practice the handshapes, thus, he did not use sign language to communicate his needs to his mother, and other family members. This is either because he has not practiced “reading” handshapes or has very short attention span. As for the receptive skill level, NC was able to show correct responses to the worker’s requests, i.e. picking pictures of chicken, cow, horse and so on. However, there is an indication that NC actually did not
understand the instructions given by the worker as he failed to respond correctly. For example, when the worker signed COW, NC picked up the picture of a goat first and then he randomly picked up other images until he saw the worker nod. The same situation occurred in the other two sessions.

**Figure 4.46: Responses in “animal farm” activity**

![Figure 4.46(a) – (c) shows the sign vocabularies for COW, HORSE and GOAT respectively. The handshape for COW is wrong and it should be in the form of handshape “Y” ( ). The phonology for HORSE is correct. As for GOAT, NC has made a wrong handshape to form it, the handshapes should be “C” ( ) and then “V” ( ) instead of the one shown in Figure 4.46(c).**

For the activities “Cutting and Cooking” and “Reading Jovi”, NC did not show that he is capable of expressing by himself the 13 targeted sign vocabularies in all sessions. He imitated some sign vocabularies such as BREAD, CABBAGE, CORN, ONION, FORK,
KNIFE, CHEESE after the worker, which can be viewed only in the last two sessions. Some of the sign vocabularies mentioned can be viewed in Figure 4.47.

**Figure 4.47:** Responses in “cutting and cooking” activity

![Response Images](a) (b) (c) (d)

Figure 4.47(a) – (d) show the sign vocabulary EGG, CORN, SPOON and ONION. The handshapes for all these sign vocabularies are not correct. The handshape for EGG should be “C” ( ) instead of “5” ( ), CORN should be “S” ( ) instead of “O” ( ) and SPOON should be “T” ( ) instead of “O” ( ) and ONION should be “X” ( ) instead of “1” ( ).

It was noticed that NC produced and completed these sign vocabularies very fast (faster than the normal timing), for example, when the worker starts to sign EGG, those who are looking can see the complete sign and understand it. However, NC completed signing too fast that people do not get a chance to look at it properly. This situation does not indicate that he can sign these sign vocabularies faster than normal, it only indicates that NC is not ready for language learning as he has not learnt attention span to acquire sign vocabularies. He had also imitated certain sign vocabularies which are not targeted sign vocabularies, i.e. EAT with correct handshape which can be seen in Table 4.5.
Table 4.5: Collection of non-targeted sign vocabulary in the sessions

<table>
<thead>
<tr>
<th>Session</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>First session</td>
<td>Nil</td>
</tr>
<tr>
<td>Second session</td>
<td>Nil</td>
</tr>
<tr>
<td>Third session</td>
<td>NC signs after the worker – eat</td>
</tr>
</tbody>
</table>

Table 4.6 shows the occurrence of the responses in all the sessions, i.e. how many times NC has produced sign vocabularies, with or without errors, shows how much NC was able to follow the worker’s instructions and the occurrence of imitating the worker.

Table 4.6: Occurrence of the responses in the sessions

<table>
<thead>
<tr>
<th>Responses according to the tasks (the worker’s instruction)</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide the correct response (sign)</td>
<td>1</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Perform the right action</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Imitate the worker’s sign vocabulary</td>
<td>12</td>
<td>12</td>
<td>13</td>
</tr>
</tbody>
</table>

The occurrences are parallel with NC’s mother’s description on NC’s expressive and receptive skills. The result of the sessions that NC participated in clearly shows that NC has not acquired many sign vocabularies. He could not even make right handshapes to form a sign vocabulary.

In summing up the activities NC has gone through, it can be said that he has short attention span since the worker is unable to get him to sit still for the learning sessions. The worker had difficulties to get NC to sign on his own. Although his mother was there with them at almost all the learning sessions, she was unable to get NC to sign. Most of the signs NC showed did not have proper handshapes. This indicates that NC can only use gesture communication when following the EIP worker’s instructions.
4.3.4 Subject 4: JK

The interview with JK’s mother revealed that JK has expressed by herself as many as 60 sign vocabularies, as in Appendix 7 prior to the learning activity sessions. The learning activity sessions with JK revealed that both of her receptive and expressive responses in sign language were good.

In the activity “Putting round chips into board columns” in the all sessions, JK did not sign GREEN and PURPLE. She did not even show a single response towards the worker’s instructions which was telling JK to put green and purple chips into the board columns.

In the activity “Matching picture to picture” in the first two sessions, JK did not produce or imitate sign vocabularies for BURGER, TOMATO, SOUP and JELLY. However, JK signed as well as imitated sign vocabularies for BURGER, TOMATO and JELLY in the last session as a response to the worker’s questions, as in Figure 4.48.

Figure 4.48: Responses in “matching picture to picture” activity

Figure 4.48(a) – (c) show the sign vocabularies JK has formed for JELLY, TOMATO and BURGER. The handshape for all these sign vocabularies are correct. The sign
vocabulary for TOMATO that JK has shown (handshape “5” ( ) rubbed on one cheek) is different from the signs produced by other subjects, which is formed with a handshape “C” ( ) and then put on both cheeks. If her cousin didn’t come on that day, JK would have never revealed her actual ability to use sign language.

Unfortunately, the sign vocabularies, which were suddenly expressed by JK, was not directed at the worker, but at her cousin about her age, who was sitting next to her after JK invited her to sit next to her. It was very interesting to notice this unexpected situation. Furthermore, JK has signed these signs correctly. It indicates that she actually understands and is able to read the sign vocabularies produced by the worker but it could be either that she chose to be quiet while learning or she was not feel comfortable with the worker. JK taught her cousin to sign. She even moved her cousin’s hands to the correct handshapes and locations so that her cousin could sign correctly, as in Figure 4.49.

**Figure 4.49: JK teaching her cousin**

The set of images in Figure 4.49 shows the situation where JK was teaching her cousin to sign TOMATO, BURGER and SOUP respectively. She moved her cousin’s hand to the correct position and helped her form the correct handshape so that her cousin could sign the sign vocabularies correctly.
Besides that, JK was capable of picking up the correct pictures when the worker signed BURGER, TOMATO, SOUP and JELLY which was a sign that she understood the worker’s instructions. She was also able to match the pictures of the burger, tomato, soup and jelly to its identical pair after the worker signed WHERE (Translation: Which is the pair?). It is obvious to see that in the first session, she chose to be quiet, paid good attention and understood the worker, and then in following sessions, she started to imitate and sign the objects.

In the activity “Animal Farm”, JK was not able to express by herself the 9 targeted sign vocabularies and neither did she imitate the signs after the worker in the first and second sessions. However, the progress in the third session was different, she started to sign COW and GOAT as in Figure 4.50, and imitated CHICKEN, COW, HORSE, GOAT and DUCK as in Figure 4.51. However her receptive skills were not revealed as she kept quiet throughout most of the sessions.

**Figure 4.50: Responses in “animal farm” activity**

JK formed sign vocabularies COW and GOAT as in Figure 4.50(a) and (b) respectively. She signed the wrong handshape for COW which should be “Y” ( 🐮 ) instead of “A” ( 🐮 ), a common error produced by other subjects. The phonologies for GOAT looked fine.
Figure 4.51: JK copying the worker for HORSE, CHICKEN and DUCK

Figure 4.51(a) – (c) show the sign vocabularies for HORSE, CHICKEN and DUCK that JK has reproduced after the worker. The phonologies for HORSE, CHICKEN and DUCK that JK signed were correct.

For the activity “Cutting and Cooking” in all the sessions, JK expressed none of the targeted vocabularies of the activity. JK’s receptive skills were revealed in this activity which was to perform tasks, initiated by the worker. JK chose bread, egg, corn and spoon objects correctly to match the sign vocabularies signed by the worker. The only response JK showed in the last activity “Reading Jovi” is when she formed the sign vocabulary for BIRD when she saw the picture of a bird in the book. Meanwhile, JK has imitated other sign vocabularies which are not targeted sign vocabularies, i.e. HOUSE, MOTHER and GRANDMOTHER which can be seen in Table 4.7.

Table 4.7: Collection of non-targeted sign vocabulary in the sessions

| First session | JK signs after the worker – house, mother, sleep  
|               | JK answers (sign vocabulary) – grandmother |
| Second session| JK signs after the worker – cake, sleep, like, think |
| Third session | JK signs after the worker – baby, adult, no, ant, animal |

Table 4.8 shows the occurrence of the responses in all the sessions, i.e. how many times JK has produced the sign vocabularies, with or without errors, shows how much JK could follow the worker’s instructions and the occurrence of imitating the worker.
Table 4.8: Occurrence of the responses in the sessions

<table>
<thead>
<tr>
<th>Responses according to the tasks (the worker’s instruction)</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide the correct response (sign)</td>
<td>nil</td>
<td>nil</td>
<td>9</td>
</tr>
<tr>
<td>Perform the right action</td>
<td>3</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Imitate the worker’s sign vocabulary</td>
<td>nil</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

The occurrences in the beginning did not seem to be parallel to JK’s mother’s and grandmother’s description of JK’s expressive and receptive skills until when her cousin appeared in the last session. JK revealed that she was actually capable of using sign language. The result of the sessions that JK participated in clearly shows that JK has acquired many sign vocabularies even though she did not seem to perform well during the sessions.

In summing up the activities JK has been gone through, it can be said that she was very reserved and quiet most of the time, which surprised her grandmother and mother as it was unusual for JK to be quiet. She is a fast learner and one can notice that after teaching her in the first session, she was able to remember the task subsequently for the next 2 sessions.
5.0 Introduction

The study sets out to investigate the nature of Deaf children’s sign language vocabulary learning, and how vocabulary learning aids their sign language acquisition. After analyzing and discussing the data from the four subjects’ responses in formal learning activity sessions and their daily lives through their mothers’ reports, the following conclusions can be formulated to answer the research questions stated in Chapter One of the study.

RQ1: What is the level of expressive and receptive sign language mastery presented by the four Deaf subjects?

The description of the expressive and receptive skills of the Deaf children comes from analyzing the data obtained from 3 sources, the learning activity sessions, the observation report, and the parents’ interview report. The analysis of the recorded activity sessions shows that Subject 1, AE and Subject 3, NC have similar capability in the expressive and receptive skills level, while Subject 2, HW and Subject 4, JK share common elements in both of the skills. Hence, they can be divided into two groups; the former (AE and NC) is categorized as Group-A, and the latter (HW and JK) as Group-B.

Group-A revealed that their receptive and expressive responses in sign language were limited during the learning sessions. In term of expressive responses, they were not able
to sign most of the targeted sign vocabularies as seen in Table 5.1. It could be that they did not get a lot of home education where they would have learnt new sign vocabulary from their mothers.

Table 5.1 Comparison between AE and NC in expressing sign vocabularies as responses in all the five learning activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>AE was able to sign:</th>
<th>NC was able to sign:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 1</td>
<td>None of the 2 sign vocabularies</td>
<td>None of the 2 sign vocabularies</td>
</tr>
<tr>
<td>Activity 2</td>
<td>1 of the 4 sign vocabularies</td>
<td>None of the 4 sign vocabularies</td>
</tr>
<tr>
<td>Activity 3</td>
<td>None of the 9 sign vocabularies</td>
<td>5 of the 9 sign vocabularies</td>
</tr>
<tr>
<td>Activity 4</td>
<td>None of the 12 sign vocabularies</td>
<td>None of the 12 sign vocabularies</td>
</tr>
<tr>
<td>Activity 5</td>
<td>None of the 2 sign vocabularies</td>
<td>None of the 2 sign vocabularies</td>
</tr>
</tbody>
</table>

The analysis shows that AE and NC could only express 13 and 8 sign vocabularies respectively prior to the learning activity sessions. Watson, Watson and Wilson (1999) suggested that children from eight months old repeat the words they are learning over and over, as in practicing so that they will be able to combine sounds, babbling and words. In case of using sign vocabularies, the Group-A subjects would be able to express the targeted sign vocabularies in the learning sessions if they have acquired and recalled more than 50 sign vocabularies. Since they were not given the opportunity to practice the sign vocabularies they have learnt, they were not able to form handshapes correctly. It is because the Deaf children have to rely on Deaf adults to acquire sign vocabularies; unlike Hearing children can acquire language input from many sources, for example, television, and more Hearing people live around him/her. It is noticed that AE could not form correct handshapes for “H” ( ), “V” ( ) and “Y” ( ) and NC could not make correct handshapes for “V” ( ), “Y” ( ), “T” ( ) and “X” ( ). Based on the stages of handshape acquisition proposed by Volterra and Erting
(1998), it can be concluded that AE and NC have not reached Stage III yet. Handshape “H” (lığı) was not listed in Stage III, however, its handshape is actually the same to “U” (lığı) handshape. It indicates that they are still in Stage II and needs more practice on forming the handshapes accurately. The result seems to be consistent with Rush (2011) and Marschark and Hauser (2012) who suggest that the impact of the parents’ great efforts or consistent signing to the children are strongly positive on the children’s sign language acquisition. Without the great efforts and consistence of signing, the children will not be able to acquire sign language on their own.

Besides that, they have short attention span; therefore, they failed to observe the signs produced by the Early Intervention Programme (EIP) worker properly. They were not able to identify and differentiate between signs, for instance, AE signed CAUGHT (as in Figure 5.1) for both JELLY and SOUP while NC signed GOAT (as in Figure 5.2) for both SHEEP and COW. As for receptive responses, they could not understand the EIP worker’s instruction when she asked for the picture of ‘BURGER’ by signing BURGER, for instance. They did not pick up the correct picture at the first go. They still not able to pick up correct picture after several tries.

Figure 5.1: AE signed CAUGHT for both JELLY and SOUP
Figure 5.2: NC signed GOAT for both SHEEP and COW

AE and NC acquired less than 15 sign vocabularies prior to the sessions, and they were not able to produce two-word sentences. During the observation at their respective homes and learning sessions, they never initiate or respond to a simple conversation. It is parallel to Watson’s, Watson’s and Wilson’s (1999) suggestion that the child should be able to produce two-word sentences and carry a simple conversation as a result of having acquired more than 50 vocabularies at the age of 2 years old. With these abilities, both of them are considered to have not acquired sign language well in terms of expressive and receptive skills.

Group-B revealed that their receptive responses in sign language were good as they are able to give correct responses to the worker. HW’s expressive responses are good and JK’s expressive responses seem to be limited during the learning sessions in responding to the worker by showing right actions to the worker. HW showed more than 15 right actions to the worker in three sessions, while JK was only able to show the three, fifteen and five right actions in the first, second and third sessions respectively. In terms of expressive responses, HW was able to sign most of the targeted sign vocabularies as seen in Table 5.2.
Table 5.2: Comparison between HW and JK in expressing sign vocabularies as responses in all the five learning activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>HW was able to sign:</th>
<th>JK was able to sign:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 1</td>
<td>2 of the 2 sign vocabularies</td>
<td>None of the 2 sign vocabularies</td>
</tr>
<tr>
<td>Activity 2</td>
<td>4 of the 4 sign vocabularies</td>
<td>3 of the 4 sign vocabularies</td>
</tr>
<tr>
<td>Activity 3</td>
<td>9 of the 9 sign vocabularies</td>
<td>None of the 9 sign vocabularies</td>
</tr>
<tr>
<td>Activity 4</td>
<td>5 of the 12 sign vocabularies</td>
<td>None of the 12 sign vocabularies</td>
</tr>
<tr>
<td>Activity 5</td>
<td>None of the 2 sign vocabularies</td>
<td>None of the 2 sign vocabularies</td>
</tr>
</tbody>
</table>

However, JK did not show the same performance as she kept quiet. Despite the big difference in the expressive responses between HW and JK, JK showed outstanding performance in the last session where she expressed three sign vocabularies correctly when her cousin was present next to her. JK has formed handshapes correctly as HW did. JK was reserved and quiet most of the time, which could be the reason that she had not expressed the targeted sign vocabularies as well as HW had. Watson, Watson & Wilson proposed that at the age of 24 months, children enjoy the company of other children, and would interact more in the presence of other children. For this reason, JK started to interact with her cousin by signing and showing the correct handshape.

Not a lot of phonological errors were observed when they were forming handshapes. The only wrong handshape they formed was the handshape “Y” (🫀) which was replaced with the handshape “A” (🫂). The low occurrence of phonological errors in their handshapes indicates that they have been practicing the handshapes on a daily basis, as their mothers constantly teach them new sign vocabularies as well as do reviews with them. They practiced the handshapes when they signed each object they saw when they were outside, for instance, when they saw a dog on a road, it would prompt them to sign DOG. Besides that, they have good attention span; therefore, they
observed the signs produced by the EIP worker properly and would remember the right handshape.

HW and JK were able to express 97 and 60 sign vocabularies respectively prior to the learning activity sessions. Therefore, they were capable of making sentences comprising of more than one word and make requests as Watson, Watson and Wilson (1999) had proposed children at this age should be able to do. Their capabilities met the Rush’s (2011, p. 2) proposal that “with consistent use of signing … the children became empowered to express themselves more readily and more appropriately than other preschoolers did not have signs available to them.” Marschark and Hauser (2012) also suggest that the children with the bigger amount of sign vocabulary are more open to being educated. Both HW and JK were able of carrying out a simple conversation with their parent (as reported in Chapter Four) while they were observed during the researcher’s visit prior to the learning sessions. This shows that HW and JK’s parents put a lot of efforts to assist them to acquire as many sign vocabulary as possible. It also helps that the parents have sufficient amount of sign vocabulary to teach the children. As for the receptive responses, they could understand the EIP worker’s instruction when she asked for the picture of a burger by signing BURGER, for instance. They both were able to pick up the corresponding picture at the first go. It is parallel to Cromwell’s proposal that comprehension develops gradually through exposure to language and through opportunities to practice language. With these abilities, both of them are considered to have acquired sign language well in terms of expressive and receptive skills.
RQ2: To what extent does the amount of input and practice within their individual linguistic environment influence the respective children’s level of mastery in sign language?

The sign language acquisition may occur to the subjects in a conducive environment where opportunities for sign language learning and exposure are present. In Malaysia, sign language is not widely used and can hardly be seen in media channels such as television, radio and books. Hence, the possibility for the subjects to be exposed to sign language is limited to the home or the special school they attend. As such, the parents need to make it possible so that the subjects are able to use sign language by creating opportunities of seeing and learning sign language. These hard-find opportunities need to be made available constantly.

HW’s parents create these opportunities by having language learning activities with HW almost every night and by keeping HW engaged in conversation whenever possible. Initially, it would be difficult for her mother to start the sessions with HW as HW is the first child and she lacks the experience and teaching skills. However, she made it possible and was highly determined and patient in teaching HW for months. The consequence of her commitment has helped HW to make two-word sentences to make requests or ask questions.

On the other hand, JK is most of the time separated from her parents as she lives with her hearing grandmother, who coincidentally was a former teacher for Deaf students, therefore the grandmother knows sign language. JK also lives with other hearing relatives, including the grandmother. There is no single Deaf person living or staying with her. Although, JK lives in the hearing culture, her grandmother and mother
constantly make opportunities for JK to be exposed to sign language by introducing sign vocabulary for the things JK has seen. JK is actually capable to make two-word sentences when observations of the learning activities show the opposite.

For AE and NC, their mothers do not create consistent opportunities for sign language learning for them. The mothers are with them most of the time, but for AE and NC each have an elder sister, who is also a sign language user and their respective playmate. However, the sisters are not likely to teach them sign language as the communication between the siblings is more gesture visual communication. Gesture visual communication happens when one of the interlocutors does not know how to sign to convey the ideas, in both these cases, AE and NC.

Hoff (2009) proposed that cultures differ in how explicitly language is taught. Thus, Deaf culture plays an important role in children sign language acquisition. As there are not many language use/practice opportunities for the children to learn sign language, the parents of the Deaf have to be active in assisting them in acquiring sign language since they are the closest to the children. HW and JK are able to enjoy the opportunities as their parents are committed to their sign language acquisition, while AE and NC did not have the same opportunity, which helps to support the findings of this study. Despite the fact that AE’s mother is a teacher of Deaf students; his mother does not actually give her commitment towards AE’s language acquisition. In the same way, NC’s mother is a full time housewife, yet she does not commit her time for NC’s sign language learning. The mothers may get frustrated with AE and NC respectively, which is similar to Thomson, Kennedy and Kuebli’s (2011) finding of the cause of the children’s hearing mothers engaging less in the sign language interaction with them.
Their parents are not aware that the need of Deaf children for sign language acquisition is different from child to child and also from culture to culture as what Hoff (2009) has proposed. Each child learns in different ways to acquire languages depending on the cultural practice of the culture group he/she is living in. Therefore, the subjects need to experience their own Deaf culture in order to acquire language, where they will depend on the sight and hands when using sign language and they need to be aware that the sign language can be found from the Deaf adults mostly, unlike the hearing children, who can learn languages from many resources. Hoff states that it is clear that all cultures provide adequate experience for language acquisition, because children in all cultures learn to talk, and it has been argued that all cultures equally provide children with the experiences they need for language development, albeit in different ways.

Deaf children acquire language through their eyes instead of the ears. It is totally different for those without hearing disability. The Deaf children have to put in more effort in capturing “sounds” surrounding them. The Deaf children have to do the capturing manually so that they will be able to pick up what is happening around them. Their parents need to assist the Deaf children to understand how they can acquire and understand their surroundings. The Deaf children’s sight becomes sharpened and more sensitive if they are trained well from the birth. HW and JK are experiencing the Deaf Culture as they understand how to get attention from their parents before they begin signing conversing with them. AE and NC do not do the same thing. Throughout the time the research was carried out, they were rarely seen talking with their parents.

The Deaf children can use their hands to communicate their needs to their parents once their motor skills are more developed, they would be more capable to grasp or control their fingers. To assist the Deaf children, the parents have to sign towards the children’s
faces. If necessary, the parents will need to move nearer the object that the children are looking at, so that their attention can be drawn to their parents’ signing, as Thomson, Kennedy and Kuebli (2011) mention that eye contact is important to ensure the effective of their communication. The parents have to practice such action so that the children will know they need to pay attention to their parents when the parents are talking to them. In this way, the children will receive more input and start to process the input in their brain and then their comprehension will be improved. Therefore, the Deaf parents have to put in more efforts when assisting the Deaf children acquiring more input, comparing to the assistance available for Hearing children learning language.

In summing up the conclusion, it is important for the parents to be active in assisting the Deaf children acquire sign language from birth as the Deaf children would not be able to seek language learning opportunity from the regular surrounding. As Meronen and Ahonen (2008) that the Deaf children of Deaf parents and Hearing children of Hearing parents should have many similarities and experiences, however, the opportunities both of Deaf child and Hearing child acquiring language input are different. Therefore, the Deaf parents have to create a sign-language environment; similar to the same environment Hearing child is in so that the Deaf child will be able to acquire language input from books, games, and movies that using sign language, which Guasti (2002) proposed that language develops spontaneously by exposure to linguistic input on the basis of what children see. It is not possible for each of the Deaf parents to create such the environment as the type of books, games and movies (using sign language) are hard to find in Malaysia.

It is a necessary for the children to be exposed to more sign vocabulary from birth as possible so that there will be no language delay as what NC and AE have gone through.
5.1 Recommendations

As it can be gathered from the conclusions above based on the research questions as well as the background literature presented in Chapter Two, language learning among Deaf children is a complex development and process. Patience and hard work are needed to help the Deaf children despite their hearing disability. If the Deaf children are able to acquire their society’s language, that is Sign Language, then they would have no big problem in communicating and expressing their needs. This study has provided evidence and more understanding on how the level of vocabulary the children has acquired will impact their Sign Language fluency.

Therefore, parents, caregivers, or teachers of special education who are dealing with the children with hearing impairments are encouraged to understand Deaf culture and norms so that they will be able to help the Deaf children in their learning effectively. In order to be able to help the children ease through their learning, the caregivers, parents and teachers need to be equipped with knowledge of Deaf children’s needs and unique techniques in learning language. To avoid the language delay the Deaf children may experience, each child born have to be diagnosed as early as possible for their hearing status. Thus if they are found to be Deaf, then appropriate action can be taken to help them.

Many day care centres and kindergartens can be found in Malaysia; however, not many are equipped or trained to handle Deaf children. Even if there is a centre which can take Deaf children in, early intervention programme need to be run so that the Deaf children will be trained for their attention span and language learning. Otherwise, the parents have to put tireless effort in helping the Deaf children to go through language
development. For that, the parents need to attend a course where they will be taught on how to help the Deaf children, i.e. mastering in Sign Language, know how many vocabulary can be given to the children based on their age, when to teach them, how to be positive in responding them and what necessary actions need to be taken to deal with the Deaf children.

The currently existing Non-Government Organisations (NGO) and Deaf Centre which has run the intervention programme will become more effective with this research report. Therefore, it is crucial to train more people, especially Deaf adults who can be working with Deaf children in intervention programme or other service with different special needs that the Deaf children might need to go through, especially language learning. There is a dire shortage of teachers of intervention programme for the Deaf children; as a result not many Deaf children have opportunity in pick up more vocabulary at early age. It would be ideal if sufficient teacher for the Deaf children are trained and can be spread to many areas so that it will be accessible for the children and their parents.

Lastly, research into the children language learning and their language delay often occurs, the actions to help the Deaf children are almost unheard in Malaysia. To develop and generate a deeper understanding of Deaf children’s language learning at early stage of age, research studies need to be conducted based on the local context, instead of merely relying on studies conducted overseas at University or College levels. The research culture is yet to be cultivated locally, but the setting up of a research centre specializing in local Sign Language and Deaf culture that is led by a team of academicians and professionals would boost the awareness as well as upgrade the current services provided. With more studies being conducted, more knowledge,
discussions and findings could be debated, shared and disseminated throughout Malaysia and to the world. This would contribute to the advancement of the scientific investigation on the Deaf children’s language acquisition and hopefully would one day demystify all the unanswered questions on the language acquisition that have been puzzling the special education department in Malaysia for long.

5.2 Further Research

As pointed out in Chapter Two, research work in Deaf children language acquisition lead to more questions than answers as much needs to be done in the attempt to understand the children in sign language acquisition. Many studies has been carried out on the special education in schools, preschool curriculum for hearing children, and why and how hearing impaired affects the cognitive, communicative, social and emotional development of children with hearing disability. Many theories and hypotheses have been suggested but only time will tell if they are close to disclosure the fact about the Deaf children’s sign language acquisition. With the advancement in technology, hopefully, researcher would be able to dig deeper on how the children start to pick up their language and looks for the features that would help encourage the children to pick the language up with fast pace.

In the field of linguistics, future research could look into how the Deaf children perceive, process and produce language, at phonetic, phonological, syntactical, semantic or morphological level. By employing a research methodology with some linguistics analysis, researchers could investigate how language is processed, stored, represented and retrieve in the brain without hearing ability. This would be able to disclose the
actual system of language learning by the Deaf children and these will be enable the other parents to help their Deaf children improve their language learning better.

With regard to education and curriculum for Deaf infants in daycare centres or at home, a follow-up study may investigate the same research questions as outlined in the study but more extensively with more data collected from a larger number of subjects, so as to compare and contrast the findings to see if there are similar patterns as well as common features. It is the researcher’s hope that the study would act as a springboard or blueprint for more studies to be conducted on the Deaf children in picking up sign language with eyes. Only with more time and subjects, data and discussion can be more conclusive, convincing and representative of the language learning in Malaysia.