Chapter 4

Analyses and Results

Introduction

The data collected for this study came from three different sources namely, from the parents, teachers and pupils, and these were analyzed separately. The analysis of the parents' responses, teachers' responses and pupils' responses were presented as appendices in this research report. The result of the tests conducted were also presented to supplement the findings of the interviews. A table may precede or follow the statement of results to highlight the salient aspects of the findings.

Hence, the findings of the interviews as well as tests results will be presented in this chapter.

Presentation of the Findings

The Results of the Interviews (Appendix 2-4)

Background of pupils

A majority of the respondents' hearing losses were detected very early, at aged two, when parents suspected their children were not able to talk and respond to sounds. They sought professional help and were confirmed of their children having hearing losses. All of them were having impairments in both ears ranging from severe to profound. Audiograms of these children show a severe bilateral high frequency sensori-neural hearing loss. (Refer to an example of an audiogram of a child with profound hearing loss in both ears – Appendix 15). In this case, they may miss a lot of the speech sounds though they may be aware of them.

Table 1 : Pupils background

(App. 4 Q. 1) (App. 4 Q. 2)

Age (Years	Pupils	Year Group
7	5	2
8	6	2
9	5	4
10	6	4

Number of respondents = 22 pupils (100%)

Eleven of the children were in Year Two (1 Girl and 10 Boys) and another eleven in Year 4 (8 Girls and 3 Boys) were attending special classes in the regular school. The year two children have a mean age of 7:06 while the year four pupils have a mean age of 9:07. Half of the twenty-two children were in their second year of schooling and the other half were in their fourth year.

Table 2: Types of Hearing Loss

(App. 2 Q. 1)

Types of Hearing Loss	Pupils	Percentage (%)
Mild	-	-
Moderate	-	-
Severe	3	13.6
Severe-to-profound	6	27.3
Profound	13	59.1

Number of respondents = 22 parents (100%) and 22 pupils (100%)

There are five types of hearing losses. Hearing losses may range from mild to moderate, severe to profound. As seen from the above table, three of them were diagnosed as having severe hearing loss (about 70dB), six of them having severe-to-profound hearing loss (71-90dB) while a majority of them (59%) were diagnosed with having profound hearing loss of more than 110 dB, which entitled them to be named as

hearing-impaired. None of them have mild or moderate hearing loss or which is also called hard-of-hearing.

Specialized equipment

All the children were fitted with BTE hearing-aids in both ears. The hearing-aid or amplifier is a device that makes sound louder so that these pupils may learn to listen better with appropriate amplification, and may learn to make use of parts of the sound to help them understand the speech of others and also to produce their own speech. It is said, however, that if a hearing-impaired child is not stimulated by sound-through-amplification at an early age, the auditory nervous system may not develop as completely as it can (Calvert, 1984). Because they are very important for learning speech, parents should understand how they work and how they should be used.

Besides the hearing-aids, these children used the FM system as an additional aid in the classroom. With a classroom FM system, the carrier wave is transmitted through the air via frequency modulation from a teacher-worn microphone to the pupil worn receiver with no need for restrictive wire attachments (Ross & Giolas, 1978).

Table 3: Age of child when detected with a hearing loss and when they are fitted with hearing-aids

	(App. 2 Q 1)		(App. 2 Q2)
Age (Months)	Parents	Hearing-aids Worn	Parents
Less than 24	-	Less than 24 months	-
25-36	8	25-36	3
37-48	14	37-48	12
More than 48	-	More than 48	7

Number of respondents = 22 parents (100%)

As can be seen from the above table, all the pupils were wearing hearing-aids by age 5 and a majority of them (54.5%) were fitted with hearing-aids at age four while three of them started wearing hearing-aids at age 3 and another seven of them started to use them at age 5. Therefore, all of them have already been wearing hearing-aids even before going to school. This is due to the fact that parents realized the importance of the hearing-aids, thus encouraged and trained their children to use them regularly.

Fourteen of them (63.6%) were detected with hearing loss when they were between three to four years of age, while eight of them (36.4%) were between two to three years. As such, about 36% of the parents were able to detect their children hearing losses very early in life and thus able to provide them with hearing-aids. Similarly, the other 64% were fitted with hearing-aids as early as possible after diagnosis.

This indicates the importance of early detection and that, hearing-aids should be used as early as possible and children must be stimulated by speech: speech produced by others and vocalizations produced by themselves.

Table 4: Hearing-aids management

	(App. 2 Q 10)	(App. 4 Q 9)
Management	Parents	Pupils
Independent	15	15
Require little assistance	6	5
Require much assistance	1	2

Number of respondents = 22 parents (100%) and 22 pupils (100%)

About 95% of them were able to wear these devices by themselves or with little assistance. Only one of them required adult supervision as she would not wear them unless being told and be assisted.

All the children were aware of the importance of their hearing-aids and they knew that they were useful devices so they must learn to take care of them, as well as able to put them on independently or with little assistance. A hearing-aid is 'a small device that picks up sound with a microphone, amplifies and filters it, and then conveys that sound into the ear canal through a loud speaker (receiver). The amplifiers in the hearing-aid make sounds louder' (Northern & Downs, 1978). While the classroom teacher is responsible for the management of the FM system, each pupil is then directly responsible for maintenance as well as personal management of their own units, eg. a regular monitoring system is essential. This is to ensure that their hearing-aids are functioning at all times. This should include a thorough listening test which may detect changes in the amplified sound (Dyke, L.V. ,1982 in Northern and Downs, 1978). This is one way in which the teacher helps the pupil to acquire independent living skills.

Table 5: Hearing-aids usage

	(App. 2 Q 11)	(App. 4 Q 10)
Daily Usage (Hours)	Parents	Pupils
Less than 5	-	-
5-10	7	7
10-15	15	14
More than 15	-	-

Number of respondents = 22 parents (100%) and 21 pupils (95.4%)

About fifteen of the children wear their hearing aids for most part of the day, i.e. about 10 to 14 hours, except when they are bathing, swimming or sleeping. Only seven of them (31.8%) wear their hearing-ads during school hours and none of them wear either less than five hours or more than fifteen hours a day. However, one student did not respond.

Communication methods used

The main mode of communication commonly used by school-aged pupils is Bahasa Malaysia Kod Tangan (BMKT) in the philosophy of Total Communication. However, there are other options available, like oral-auditory method, fingerspelling and others.

Table 6: Types of communication modes currently being used

	(App. 2 Q 3)	(App. 3 Q 3)	(App. 4 Q 3)
Modes	Parents	Teachers	Pupils
Oralism	-	3	-
Total Communication	-	3	-
Cued Speech	22	2	22
Others	8	1	-

Number of respondents = 22 parents (100%)

All 22 parents used Cued Speech when communicating with their hearing-impaired children. Currently, all the pupils were using Cued Speech as their means of communication between them and their parents (since they started the early intervention programme) and between them and their class teachers as well as friends.

Before Cued Speech was introduced, four of the parents (18%) tried oralism and found that it was not beneficial to them and their children, while another three of them (16.6%) tried gestures, body language and speaking alone and found that neither of these worked with their children as they were not getting any responses from their children. Five of the parents (22.7%) started to sign (TC) with their children and felt frustrated and more dissatisfaction with their children's little progress after six months, especially, in terms of communication and speech production. This means that, in most cases, they are not vocalizing and not attempting to speak as well as not able to exchange opinions with

their families or peers and more often than not, their intended message was not understood or misinterpreted.

There are various methods of communications used by the hearing-impaired nowadays, Total Communication (TC) being the most popular. Despite its popularity, these minority group of parents (100%) chose this particular method, i .e. Cued Speech as a means of communication due to the following reasons: simple (45%), easy to remember and used (54.5%), their children were able to talk (72.7%) and lastly ease their flow of communication (91%) in a more meaningful way and a spontaneous one too.

Table 7: Why Cued Speech is favoured?

	(App. 2 Q 4)	(App. 3 Q 5)	(App. 4 Q 5)
Reasons	Parents	Teachers	Pupils
Easy to Learn	10	3	20
Easy to Remember	12	4	22
Child can talk	16	5	15
Helps in Communication	20	4	22

Number of respondents = 22 parents (100%) 5 Teachers (100%) 22 Pupils (100%)

From the above table, these parents preferred Cued Speech compared to other modes because they claimed that is was much easier to learn and use, and there were not as many signs to remember as in TC. There were too many signs for them to remember to enable them to use fluently, and often they felt frustrated when they cannot find the correct signs for the intended word. Furthermore, they found it relatively easy to communicate with their children using Cued Speech and this motivates them to encourage their children to speak using speech, thus, reinforcing in speech teaching. Results could be seen after a few months of consistent teaching. This further promotes the parents to use Cued Speech.

Similarly, the teachers felt that it was much easier and simpler to teach and explain using Cued Speech and pupils were able to respond very well. The teaching-learning process was much more spontaneous and smooth for both teachers and pupils.

About 81.8% of the pupils favoured using Cued Speech and 12 parents (54.5%) switched to Cued Speech when they were not satisfied with their children's progress using Oralism or TC.

The table below (Table 8) shows the duration taken by parents and teachers to learn the cues and then, able to use them appropriately and fluently. It also shows which family members can cue to their deaf children. Only eight different handshapes (associated with consonants) and between three to five hand positions (associated with vowels) are used in Cued Speech. The entire cueing system can be learn in a matter of few hours (Tan, 1997) and most of the parents have not much difficulty in learning to do so.

In Bahasa Malaysia there are only six vowels, no consonant clusters and no liaison between spoken words, thus making it relatively easy and allowing parents to learn to cue in a short time.

Refer to Appendix 13 for the Cues in Bahasa Malaysia and

Appendix 12 for the Cues in English

Table 8: Time taken to learn Cued Speech

	(App. 2 Q 5	(App. 3 Q 6)
Time Taken	Parents	Teachers
1-2 weeks	-	-
2-4 weeks	9	2
4-6 weeks	9	-
More than 6 weeks	4	-

Number of respondents = 22 parents (100%) and 2 teachers (40%)

Generally, a majority of the parents (81.8%) can learn to cue with their hearing-impaired children in less than six weeks. Only four of them took more than six weeks to learn, being Chinese parents who are not fluent with the language itself and have difficulty with the pronunciation. Otherwise, the Malay parents took less than 4 weeks to actually learn the cues and able to use them efficiently (with ease and at normal rate similarly to speaking). According to Tan (1997), automaticity of cueing during continuous speech requires much more regular practice, however, but is nevertheless, well within the ability of the average teacher or motivated parent to accomplish.

Table 9: Family members who can cue

	(App. 2 Q 6)	(App. 4 Q 6)
Family Members	Parents	Pupils
Mother	20	20
Father	14	10
Siblings	13	11
Relatives/Guardians	2	2

Number of correspondents = 22 parents and 22 students (100%)

From the table, it was noted that mostly mothers who can cue fairly well, a majority of fathers were able to do so and some of the siblings (brothers and sisters) could do so equally well. From the information gathered from the guardians or relatives, it was interesting to know that even aunties and grandmothers were able to cue their caregivers and grandchild.

Speech Production

Table 10: Speech Production

	(App. 2 Q 7)	(App. 3 Q 10)	(App. 4 Q 8)
Speech(articulation)	Parents	Teachers	Pupils
No speech	-	-	-
Poor-not audible	4	1	6
Average	12	2	10
Good-clear	6	2	6

Number of respondents = 100%

A majority of these pupils (72.7%) produced intelligible speech which hearing people were able to understand and communicate with them and only six of them have speech that was not clear to the listener. Eighteen parents said that their children were able to produce intelligible speech, ranging from average to good (above 40%) and only four of them said that their speech were poor (less than 40%) and not understood by them and their friends. Sixteen of the pupils said that they had no speech before intervention and during auditory training using Cued Speech, they were able to use their voice to vocalize. Six of them were found to be vocal, i.e. able to produce appropriate sounds to form words after practicing Cued Speech. 68% of the parents understood their children speech while 32% of them do not understand what their children were talking about.

Since all the pupils were able to vocalize, therefore, none of these hearing-impaired pupils had no speech. This is due to the tremendous amount of auditory and speech training in the early years with the help of the hearing-aids and the use of residual hearing.

Table 10a : Speech Test

Percentage of Utterances	Pupils	Percentage (%)
0 –20%	4	18.2
21-40%	5	22.7
41-60%	6	27.3
61-80%	5	227
81-100%	2	9.1

Number of respondents = 22 pupils (100%)

From the table shown above, the test was administered with the aim to find out the number of utterances a hearing-impaired child could produce. It was shown that a majority of them could utter between three to five utterances (usually follow the number of phonemes in the word). From the test, the teacher will be able to find out the pupils' articulation in terms of clarity, voice patterns and then types of errors made, e.g. omission or substitution.

Children's Reading

These children were asked about their reading abilities and whether they enjoyed Reading and the types of books they like to read. The parents and teachers also state their views on the pupils keenness to reading and the types of books they prefer to read. The results are tabulated as shown.

Table 11: Reading Interest

	(App. 2 Q 12)	(App. 3 Q 12)	(App. 4 Q 12)
Interest in Reading	Parents	Teachers	Pupils
Not at all	-	-	-
A little	7	1	4
Average	11	1	12
A lot	4	2	6

Number of respondents = 100% of parents and pupils, 80% teachers

A large number of the children, 19 of them (81.8%) enjoyed reading and this hobby or interest in reading must be cultivated from young. Their enthusiasm in reading will provide them with more reading experiences and later, be able to use the language easily and competently. Both the parents (68.1%) and pupils (81.8%) feedback showed that the pupils enjoyed reading for enjoyment as well as for meaning, and 80% of the teachers agreed that their pupils like to read without being asked or forced. Only one teacher did not respond to this question.

Table 11a: Types of reading materials

	(App. 2 Q 13)	(App. 3 Q 13)	(App. 4 Q 13)
Reading Materials	Parents	Teachers	Pupils
Comics	22	3	20
Fiction	3	2	5
Non-fiction	17	3	18
Newspapers	9	1	5
Others-magazines	5	3	5

Number of respondents = 22 Parents (100%) 22 Teachers (100%) 22 Pupils (100%)

Types of reading materials which were of interest to young hearing-impaired children, varies from comics to storybooks to textbooks. Because of their interest in

reading, they were keen to read any books available to them especially those found in the library and their classroom and also, most of them owned story books of their own.

From the table above, nearly all the children (90.9%) enjoyed reading comics e.g Doraemon and other pictorial comics, such as Lat, the Kampung Boy, fairy tales from the Sunshine series or fables. Five of them read educational magazines (22.7%) like Kuntum and Pelajar, and only about five of them read fiction books (22.7%) , especially books on facts and information like Science and Technology. Another 22.7% enjoyed reading the newspapers (Star, Utusan Melayu).

Since these hearing-impaired pupils enjoyed reading, it was also important and useful to find out how well they could read or recognized basic sight words in a week and the number of books they could finished reading in a week. This factor will roughly given an estimate on how much interest they possess towards reading.

Table 11b: Number of books read per week

(App. 2 Q14) (App. 3 Q14) (App. 4 Q14)

No.of Books	Parents	Teachers	Pupils
Less than 2	-	1	2
3-5	8	2	8
6-8	10	1	10
More than 9	4	-	2

Number of respondents = 22 parents (100%) 22 pupils (100%) 4 teachers (80%)

Ten of the parents responded that their children read an average of six to eight books in a week while four of them read more than eight books in a week (at least a book a day). Eight of them read between three to five books while none read less than two

books. This showed that all the pupils will at least read at least two books in a week. This also showed their interest in reading.

Table 11c: Burt Word Reading Test

Reading Age	C.A. 10 Years	C.A. 9 Years	C.A. 8 Years	C.A. 7 Years
6	-	-	2	1
7	2	1	3	2
8	1	1	1	2
9	1	2	-	-
10	2	1	-	-

Number of respondents = 22 pupils (100%)

The above table indicates that only two of pupils aged 10 scored a reading age of 10; two of them aged 9 scored a reading age of 9; one eight-year-old scored a reading age of 8; and two seven-years-old scored a reading age of 7, that is, a total of about 32% of them acquiring a reading age which is equivalent to their chronological age. 54.5 % of these pupils scored an reading age of more than their actual age. Thus, it could be concluded that about 31.8% of these children are actually reading at a level appropriate to their age and a minority of 13.6% showed a reading age that is about one-two-years below their chronological age.

Table 11d: Holborn Reading Scale

Reading Age	C.A. 10 Years	C.A. 9 Years	C.A.8 Years	C.A. 7 Years
6	-	-	1	1
7	2	1	4	4
8	3	3	1	-
9	1	1	-	-
10	-	-	-	-

Number of respondents = 22 pupils (100%)

In this test, no ten-years-old scored a reading age of 10: one nine-years- old scored a reading age of 9; one eight years old scored a reading age of 8; and four seven-years-old scored a reading age of 7. This represent about 27.3% of them scoring a reading age which is equivalent to the chronological age. About 15 of them (68.1%) scored an reading age higher than actual age.

Students performance

These children have undergone at least two years of early intervention programme before they joined primary one. They have since then, at aged four and above, been using Cued Speech as their means of communication. Since joining formal schooling (Year Two and Four), the pupils sat for the school termly and yearly exams as well. Parents were asked to rate their children academic progress since intervention. The teachers gave their views on this too.

Table 12: Academic Progress

	(App. 2 Q15)	(App. 3 Q15)	(App. 4 Q15)
Progress Made	Parents	Teachers	Pupils
No Progress	-	-	-
Little Progress	5	3	7
Moderate Progress	7	4	7
A Lot of Progress	10	4	7

Number of respondents = 22 parents (100%) and 2 teachers (40%)

The table shows that all of the children (100%) have improved since intervention and none of the parents state that their children have not made any progress at all, though a small number (22.7%) made little progress. About 80% of the teachers also agreed that all the students have made some progress while 77% of the parents too agreed that their

children had made moderate to a lot of progress. Only five of the parents (22.7%) mentioned that their children made little progress. All the pupils fully agreed that they had made some progress from little to moderate to a lot of progress.

Summary of the findings

Teachers' background (teaching experience)

Five teachers were interviewed for this study. Two of them were very experienced teachers with qualifications in teaching the deaf (full-time teachers-of- the-deaf). The other three were temporary teachers, without experience and qualification. They had only started teaching six months ago and only involved as part-time teachers of the deaf, as they were mainstream teachers and they only teach certain subjects such as Religious Study, Art and Physical Education.

Table 13: Teaching experience.

(App. 3 Q1-2)

No.of Years	Teachers	Hearing-impaired
Less than 5	3 (temporary)	3 (temporary)
5-10	-	2
11-15	1 (trained)	-
More than 15	1 (trained)	-

Number of respondents = 5 teachers

As mentioned earlier, three of the teachers have less than a year teaching experience, therefore, had no experience in teaching the deaf. Since they are new in the field, they were willing to teach hearing-impaired pupils. Both of the trained teachers have undergone at least a year's specialist training in the education of the deaf and since then, have been teaching the hearing-impaired for four years. Both of these teachers were

teaching the deaf using signs (TC Programme) before teaching these particular group of pupils.

Parents' information

Initially, many parents were shocked and angry when told of their children's hearing losses. They became anxious and wanted the best for their children. Within the first few years of life, especially soon after the children started to walk but unable to talk, they noticed their speech was delayed and impaired too. Upon detection, they sought the best options available to them.

Pupils' information

All these children were born with congenital severe- to-profound hearing losses from 85 dB in both ears. Since their learning losses were detected early, they were put into early intervention programmes in order to help with speech and language development. As such, most of them have at least undergone some kind of intervention, including speech therapy.

Specialized equipment

As soon as after diagnosis, each parent tried their best to provide their children with appropriate hearing-aids. They realized that these special small devices will provide amplification to sounds so that their children learn to pick up the sounds. All the hearing-impaired children were encouraged to wear their hearing-aids throughout the school hours as well as at home and checked that their hearing devices are functional at all

times. Because they have been wearing these hearing-aids since they were at a young age, about 2-3 years old, they were able to manage them very well, e.g. putting them on, keeping them in safe boxes and take care that they do not get wet.

Apart from the hearing-aids, they were also using the Frequency Modulation (FM) system which is a wireless amplification system in which speech signal is transmitted from a microphone via the FM radio signals to an FM receiver (Madell, 1990 cited in Smith, 1995 p 200).

As required, the microphone is worn by the teacher and the receiver is worn by the pupils. All the pupils were given a receiver and the class teacher was also required to wear the FM microphone during teaching time in class.

Modes of communication

Parents have a range of choice on this matter. In this regard, they chose Cued Speech among the others which are more popular. The main reason that they preferred this mode of communication was the results their hearing-impaired children had demonstrated. The results in Table 5 shows that a majority of the teachers agreed that these children were able to learn to talk and they also agreed that Cued Speech was much easier to learn as there are not as many signs as in BMKT (signing) to remember. In addition, they supported that learning cues can help them teach difficult words that the can not find the signs for them.

Only two of the teachers-of-the-deaf were using Cued Speech while the other three teachers used a combination of all, as they were new teachers (not trained) and they

interact with the hearing-impaired children for part of the day, about thirty minutes and only twice a week, except for one of them who teaches them Religious Study daily.

The two teachers-of-the-deaf used Cued Speech when teaching these hearing-impaired pupils in most of the subjects. The other three teachers were just beginning to learn how to sign and rely on speech and gestures when teaching these pupils. However, they also showed some keenness in learning simple cues.

Speech Production

From the teacher's viewpoint, most of the pupils speech were intelligible and understood by others (hearing person). This enable them to communicate with others using speech. Only one teacher claimed that their speech was poor and not understandable. From the parent's feedback, they found it relatively easy to teach their children speech and at the same time happy that their children were learning to talk. Conversations could be carried out much more easier and as naturally as possible, therefore they were much more meaningful.

The class teachers claimed that their pupils were using phrases and sentences when communicating and only a small number of them using single words. Teachers found it helpful as their pupils were able to respond using words instead of signs and they were encouraged to ask questions. Thus, they take an active role in learning. In this manner, these pupils were able to participate actively, and exchange ideas and information and also to seek answers to their questions.

Children's Reading

Four of the teachers (80%) claimed that these children have showed some amount of interest in reading and there were none who does not like reading at all, as most of them would readily take a book to read (if available)when they had finished their class work or during library time. Among the types of books which were of interest to them, were those which consist of nursery rhymes, fairy tales, comics and some factual books on topics like animals, machines, and electricity in Science.

The table (Table 11a) showed that most of the children (60%) like to read comics, fiction and magazines rather than newspapers and non-fiction. They initiate reading without being asked or told. As such, it was noted of their interest and were being encouraged often to read as much as possible. From reading pictorial books, they moved on from simple readers to textbooks. Because of their understanding of what they read, this promotes them to read further and thus able to cultivate a habit of reading.

All teachers agreed that these hearing-impaired children were able to complete reading a book on an average of two days. The teachers said that 40% of them will be able to finish reading three to five books or five to seven books per week. However, only one teacher said that the pupils can read more than seven books a week or less than three books per week.

Academic progress

Five of the teachers agreed that the pupils have shown great improvement since they started schooling at the beginning of the year. In fact, four of them stated that the pupils have made a lot of progress (Table 12).

The children themselves felt that generally they had made some progress in all areas, especially academically. Their daily work showed that they understood concepts and able to generalize learning. Learning becomes much more interesting and simpler and they were thus able to overcome their fear in reading. They showed confidence and the level of competence in reading increases. This is due to the fact that they understood the language they are reading, for example, Bahasa Malaysia and English. Amazingly, their writing and spelling abilities also showed improvement.