CHAPTER 4
RESEARCH METHODOLOGY

4.1 INTRODUCTION

The focus of this study was the question of whether a training programme, designed to empower peers to communicate with an adolescent who used AAC, would result in increased social interaction of the adolescent who used AAC. This chapter discusses and validates the methodology selected to investigate the above research question. The varied and extensive procedures that were used to describe changes in the interaction patterns of the adolescent who used AAC within the classroom are explained. Objective quantitative measures are discussed and operational definitions of the interactive behaviours and the procedures used to measure them are defined. Qualitative analysis processes are detailed for the observational data and the pre and post measures employed in the main study.

4.2 AIMS

4.2.1 Primary Aim

The primary aim of the study was to determine the impact of a peer training programme on the interaction patterns of an adolescent who used AAC.

4.2.2 Sub-aims

The above aim was achieved in terms of the following sub-aims:

i. To determine the peer interaction patterns of the adolescent who uses AAC.
ii. To investigate the impact of a peer training programme on the interaction of the adolescent who uses AAC in terms of:
    - The frequency of interactions
    - The number of messages per interchange
    - The discourse function
    - The communicative function served and
    - The primary mode of communication used.

iii. To investigate the impact of a peer training programme on the self concept of the adolescent who uses AAC
iv. To determine the impact of a peer training programme on the peers' evaluation of the socio-metric status of the adolescent who uses AAC.
v. To determine the parents' and teachers' rating of the social interaction of the adolescent who uses AAC with peers and their evaluation of the impact of the peer training on his interaction with peers.
vi. To investigate the impact of a peer training programme on the self perception of the adolescent who uses AAC.

4.3 RESEARCH DESIGN

The study used a single subject experimental design whereby the interaction between an adolescent who uses AAC, the primary participant and his classroom peers is investigated before and after implementation of a peer training programme. Interactional behaviours were described during pre-intervention (A), intervention, (B), post intervention (A2) and post withdrawal (A3) phases of the study. The post withdrawal followed the research phase of withdrawal that lasted for a period of seven weeks. Measurements were qualitative in nature and describe in depth the interaction between the adolescent who used AAC and his peers. Changes in the frequency of interactions and in the extent of interactions (the number of messages per interchange) were quantified using descriptive statistics. Additional descriptive parameters of the observed interactions that were analysed included the discourse functions, communication functions and modes of communication of the primary participant as well as the responses of peers. Observational data were obtained from extensive videotaping in the natural context of the classroom during all phases of research except for the withdrawal phase. The perceptions of the peers, teachers and parents with regard to the interactions and social skills of the primary participant, were measured before and after the intervention using qualitative measures. Additional qualitative pre and post measures included standardised self concept scales and self evaluation procedures that were completed by the primary participant. In depth descriptive data on the social interaction of the primary participant was obtained by multiple methods including videotaping during varied classroom contexts, peer referenced assessment procedures, as well as questionnaires and interviews with the primary research participant, his teachers and his parents. The phases of research and measurements that were applied are represented in Table 4.1.

Table 4.1 Research aims and measuring instruments

Phase	Aims	Measurements	Participants	Parameters Analysed
A1 Pre Intervention Phase	Primary Aim Sub-aim i Sub-aim ii	Qualitative analyses of videotaped interactions	Adolescent who uses AAC (Primary participant). Peers	Frequency of interactions Number of messages per interchange Discourse function Communication function Mode of communication Partner Responses
	Sub-aim iii	Multidimensional Self Concept Scale	Adolescent who uses AAC	Self Concept of the adolescent who uses AAC
	Sub-aim iii	Self Description Questionnaire II	Adolescent who uses AAC	Self Concept of adolescent who uses AAC
	Sub-aim iv	PACT User Rating Scale	Adolescent who uses AAC	Communication attitudes of the adolescent who uses AAC
	Sub-aim v	PACT Partner Rating Scale - Peers	Peers	Partner communication attitudes The perception of the adolescent who uses AAC of his partner's attitudes
	Sub-aim vi	PACT Partner Rating Scale - Teachers	Teachers	
	Sub-aim vi	PACT Partner Rating Scale – Parents	Parents	Partner perceptions of the communication attitudes of the adolescent who uses AAC
	Sub-aim v	Peer Nominations	Adolescent who uses AAC. Peers	Socio-metric status of the adolescent who uses AAC
	Sub-aim iv	Interview with Adolescent who uses AAC	Adolescent who uses AAC.	The perception of the adolescent who uses AAC of his social interaction with peers
	Sub-aim vi	Interviews with teachers of adolescent who uses AAC	Teachers	Teacher's perception of the social interaction of the adolescent who uses AAC with his peers
	Sub-aim vi	Interviews with parents of adolescent who uses AAC	Parents	Parents' perception of the social interaction of the adolescent who uses AAC with his peers
B Intervention Phase (8 x 1 hour sessions)	Primary Aim Sub-aim i Sub-aim ii	Qualitative analyses of videotaped interactions -	Adolescent who uses AAC. Peers	Frequency of interactions Number of messages per interchange Discourse function Communication function Mode of communication Partner Responses

Phase	Aims	Measurements	Participants	Parameters Analysed
A2 Post Intervention Phase (2 weeks)	Primary Aim Sub-aim i Sub-aim ii	Qualitative analyses of videotaped interactions–	Adolescent who uses AAC . Peers	Frequency of interactions Number of messages per interchange Discourse function Communication function Mode of communication Partner Responses
	Sub-aim iii	Multidimensional Self Concept Scale	Adolescent who uses AAC	Self Concept of the adolescent who uses AAC
	Sub-aim iii	Self Description Questionnaire II	Adolescent who uses AAC	Self Concept of the adolescent who uses AAC
	Sub-aim iv	PACT User Rating Scale	Adolescent who uses AAC	Communication attitudes of the adolescent who uses AAC
	Sub-aim v	PACT Partner Rating Scale - Peers	Peers	Partner communication attitudes The perception of the adolescent who uses AAC of his partner' attitudes
	Sub-aim vi	PACT Partner Rating Scale - Teachers	Teachers	
	Sub-aim vi	PACT Partner Rating Scale – Parents	Parents	Partner perceptions of the communication attitudes of the adolescent who uses AAC
	Sub-aim v	Peer Nominations	Peers Adolescent who uses AAC	Socio-metric status of the adolescent who uses AAC
	Sub-aim v	Peer Ratings	Peers Adolescent who uses AAC	
	Sub-aim iv	Interview with adolescent who uses AAC	Adolescent who uses AAC	The perception of the adolescent who uses AAC of his social interaction with peers
	Sub-aim vi	Interviews with teachers of adolescent who uses AAC	Teachers	Teachers' perceptions of the social interaction of the adolescent who uses AAC with his peers
	Sub-aim vi	Interviews with parents of adolescent who uses AAC	Parents	Teachers' perception of the social interaction of the adolescent who uses AAC with his peers
Withdrawal Phase		None		None
A3 Post-Withdrawal Phase	Primary Aim Sub-aim i Sub-aim ii	Qualitative analyses of videotaped interactions	Adolescent who uses AAC Peers	Frequency of interactions Number of messages per interchange Discourse function Communication function Mode of communication Partner Responses

The single-study design was appropriate to this research project as it:

i. Facilitate the exploration of variables responsible for changing behaviour. The dependent variables being the interaction or discourse skills of the adolescent who uses AAC and the primary independent variable the peer group training programme.

ii. The opportunity to conduct an in-depth analysis of the functional effect of the treatment variable (peer group programme) on the behaviour of the adolescent who uses AAC.

To effectively document the relationship between the communication partner training programme and the outcomes it was necessary to analyze the quality of evidence associated with the intervention and observed changes. Different sources and analyses were used to provide a comprehensive perspective. This triangulation of data and methods was aimed at improving the validity of the findings and to provide depth to the understanding of both the processes and outcomes of the study through corroborative and elaborative analysis.

4.4 PILOT STUDY

4.4.1 Objective of the Pilot Study

The main objective of the pilot study was to determine the optimal system for transcribing, coding and analyzing the interactions of the adolescent who used AAC and his peers from the videotaped material. Additional objectives were to identify any potential problems in terms of the practicality or feasibility of the proposed research, including:

i. possible difficulties experienced by the video technician with respect to the videotaping in the classroom; and

ii. any responses by the peers to the videotaping that might bias the study.

The objectives, method, results and recommendations of the pilot study are shown in Table 4.2 on the following page.

Table 4.2 Objectives, method, results and recommendations of pilot study

Objectives	Method	Results	Recommendation
With respect to the transcription system			
To assess whether the temporal segmentation into 1-minute sections was feasible.	Videotapes were viewed and reviewed marking both 1-minute and 2-minute segments.	It was more practical to demarcate timed sections in units of 2 minutes.	Demarcate 2-minute segments. Where the interactional context changed during the 2-minute segment, 1 minute should be allocated to each context.
To determine whether it was possible to establish the boundaries of an interchange by content alone.	Examination of the interactions of the adolescent who uses AAC with his peers on videotape.	Certain interchanges were clearly bounded but not only by content. Multimodal behaviours such as extended pausing, turning-away from communication and /or changes in facial expression together with content indicated interchange boundaries. A number of interchanges were not clearly bounded.	Single and or multiple indications should be used to determine interchange boundaries. Where, despite the use of multiple regulation cues, the interchange boundaries cannot be clearly demarcated, the specific interchange should be viewed by the adolescent who uses AAC and the boundaries determined by him.
To evaluate the proposed division of communicative opportunity contexts.	Analysis of the videotapes with respect to the proposed contexts relating to opportunities for peer communication: i. Teacher directed ii. Working in pairs context iii. OBE Small Group context iv. Informal context	The proposed category of working in a dyad during OBE groups was not applicable as even if the adolescent was paired with a peer his facilitator was frequently also involved so that in effect a small group was formed. There was not a significant difference between communication opportunities in the proposed 'working in pairs' and 'small group OBE' contexts.	The OBE dyad and small groups should be included in the single category of OBE Small Group discussion context. Contexts to be: i. Teacher directed i. OBE Small Group discussion context ii. Informal context
To evaluate the proposed notation system	Videotapes were transcribed using the proposed notation system	Notation system fairly easy to apply consistently.	The same notation system to be used in the main study. In instances where the message of the adolescent who used AAC was not clear, it should be notated with ??? < >??? until clarified by the adolescent himself. .
To evaluate the effectiveness of the proposed spatial layout of the transcript.	Using prepared formats to transcribe the interactions of the adolescent who used AAC with his peer(s).	The proposed format proved adequate.	No changes were necessary to the spatial layout and proposed format of the transcripts.

Objectives	Method	Results	Recommendation
With respect to discourse structure:			
To assess the appropriateness of the proposed coding system.	Once the transcript had been prepared the tapes were reviewed and the codes for discourse structure, communication function, mode of communication and partner response were applied.	It proved difficult to differentiate in practice between certain of the codes. For example, requests for assistance and requests for information were indistinguishable; vocalizations and verbalizations were impossible to differentiate. The adolescent who used AAC frequently used simultaneous modes of communication with equal input, and the primary mode could not be distinguished..	Attracting attention (no message) and initiation should be combined as a single code. *With respect to communication function:* Requests for assistance and requests for information should be combined. The category of "Socialises" was deemed to be integral to other communication functions and the code should be deleted. *With respect to modes of communication* Vocalisation and verbalizations be combined under code 1. *With respect to Partner responses* Code or partner initiation needed to be added. Partner not waiting for adolescent who used AAC to complete message should be included in the code of 'partner ignores user'. Partner completes message of the adolescent who used AAC was reformulated as part of the category of 'partner clarifies message of adolescent who uses AAC'.
With respect to the video-technician and the process of filming-			
To establish any difficulties in filming the class.	By viewing the tapes to determine the quality of both the visual image and the sound	In times of high background noise levels the verbalizations of the Adolescent who uses AAC could not be heard.	A directional microphone and a lapel microphone were provided.
With respect to the response of the peers			
To asses the response of the peers to being videotaped, to evaluate any bias towards the study	Several hours of videotaping were studied.	For approximately the first two hours there appeared to be a "halo effect" in that class members appeared to be on best behaviour and frequently looked at the camera.	The pre intervention data should only be coded from when it was apparent that the class had become habituated to being videotaped.

4.4.2 Summary of the Pilot Study

Following the pilot study the spatial layout, notation conventions and transcription codes were adapted. In addition, a directional microphone and later a lapel microphone were provided to improve the sound recording of the videotapes. Partner attitudes, partner competencies and the environmental demands determine the communication opportunities within a natural context such as the classroom. In order to effectively compare the interaction of the adolescent who used AAC with his peers pre and post intervention it was necessary to determine contexts that reflected differing levels of opportunity for communicative interactions. The pilot study established that only three different contexts within the classroom allowed for varying densities of communication opportunities. These were defined as follows:

i. *Teacher directed time* included periods of teacher instruction as well as periods when the learners were engaged in independent academic tasks. Teachers expected that during these times learners would not speak and peer interactions were discouraged. This context was designated as Context 1 and allowed for minimal peer interaction.

ii. *Outcome based educational (OBE) small group discussion context* during which the class was divided into small groups. Group members were expected to contribute suggestions and comments with respect to the specified task. This context encouraged peer interactions related to the task and was designated as Context 2. Group members were not always constant and some dyads were included.

iii. *Informal time context* included times when no teacher was present, for example before or immediately after a specific lesson as well as times when a teacher was present as occurred during packing up time. This context was designated as Context 3 and allowed learners to choose whether they wished to interact or not. Learners also had relative freedom to choose with whom they wanted to interact, about what and how they wished to interact. Peer interactions during this time were voluntary.

4.5 MAIN STUDY

4.5.1 The Primary Research Participant

The primary research participant was a male adolescent who uses AAC, "S.E". He was 15 years 2 months old at the onset of the peer training programme. He had severe athetoid cerebral palsy and was the only learner in the class who required AAC. He had little functional use of his arms and legs and was dependent for all activities of daily living. S.E. required the assistance of a facilitator or a peer to pack his schoolbooks and to set up his computer and DeltaTalker™. Unable to remain in a sitting position unaided, he had a customised seating support and independently steered his power wheelchair by operating a joystick with his left hand. He utilised a headpointer to directly select the keys on both his computer keyboard and DeltaTalker ™. All of his teachers remarked on his dedication, perseverance and determination in completing schoolwork and one teacher noted he was very anxious to achieve, and was creative and original. Prior to the study S.E. had achieved above class average results in standardised tests and examinations.

S.E. was a multi-modal communicator whose preferred method of communication was speech, despite the fact that his speech lacked intelligibility. When communicating spontaneously he tended to use full sentences and had few repair strategies, tending to repeat himself verbatim when not understood. If the partner failed to understand messages repeated several times he would resort to spelling out the message letter by letter, word for word. On occasion he demonstrated passivity in that he did not protest blatantly incorrect misinterpretations of his message. At other times he would persist until understood. His awareness that peers and teachers did not understand what he had said appeared inconsistent.

Other modes of communication used by S.E. included facial expressions, eye-gaze, body movements, computer and VOCA. He was operationally competent in using the DeltaTalker™ with Unity 128 software. S.E. had mastered a core vocabulary of approximately two thousand words and short phrases using Unity 128. This software encodes words and common phrases by using sequences of pictures (icons). He understood the rationale of how the vocabulary was organised and was able to customize the software by storing specific vocabulary according to his individual needs. His rate of communication was slow as he made frequent errors in accessing the keys with his headpointer. If he had forgotten a specific sequence of icons for a word or phrase he readily changed to the alternate spell mode. He had attended a DeltaTalker™ support group at which the focus had been on mastering core vocabulary using Unity 128 and social competency skills.

His teachers described his personality as positive, very friendly, warm, affectionate, a likeable person who was fond of jokes and had an excellent sense of humour. S.E. stated he particularly enjoyed interaction with peers and familiar adults but was perceived by his teachers and parents as having poor peer relationships and no friends within his school peer group by his teachers and parents.

At home he had few social contacts. His parents described him as an affectionate and loving child. S.E. had one sibling, a brother who was two years younger. His family was English-speaking and his leisure pursuits included listening to instrumental music, exploring new computer software, designing web pages, surfing the internet and watching television. The potential changes in his level of social interaction with peers in the natural setting of the classroom were of primary concern in this study.

4.5.2 The Peer Group

The adolescent who uses AAC and his peers attended a school for learners with physical disabilities. The school followed the national school curriculum and children who could not meet the required academic standard were accommodated in special classes. At the school there was only one Grade 8 class consisting of 14 learners including S.E. There were eight boys and six girls in the class. At the onset of training the ages of the peer group varied from 12 years 7 months to 16 years 8 months. The mean age of the class was 14 years 0 months. The ages and gender of the children are presented in Table 4.3.

Table 4.3 Grade 8 learners, their ages, gender and medical diagnoses

Male	Diagnosis	Age	Female	Diagnosis	Age
S. E.	Cerebral Palsy	15 years 2 months	Peer 8	Congenital Amputee	14 years 9 months
Peer 1	Cystic Fibrosis	14 years 1month	Peer 9.	Cerebral Palsy	14 years 1 month
Peer 2	Cerebral Palsy	14 years 4 months	Peer 10.	Post head injury	14 years 3 months
Peer 3	Poliomyelitis	13 years 7 months	Peer 11	Visual impairment	14 years 8 months
Peer 4	Haemophilia	16 years 8 months	Peer 12.	Diabetis insipidus	15 years 5 months
Peer 5	Cerebral palsy	12 years 7 months	Peer 13	Visual impairment	15 years 8 months
Peer 6	Cleft Palate	14 years 5 months			
Peer 7	Diabetis insipidus	16 years 0 months			

The medium of instruction at the school was English. Five of the children were from Zulu speaking families, two were from homes where both English and Afrikaans were spoken and the remaining seven were from homes where English was the first language. Diagnoses of the learners in Grade 8 included diabetes insipidus, haemophilia, congenital upper limb amputation, cystic fibrosis, poliomyelitis, head injury, visual impairment and four members of the class were cerebral palsied. Twelve members of the class were ambulatory and two learners, including the adolescent who used AAC, utilised power wheelchairs.

4.5.3 The Teachers

At a meeting with the Grade 8 teachers prior to the study to explain the goals of the research three teachers volunteered to be videotaped and interviewed before and after the peer training programme. All three were female teachers, who had extensive teaching experience and had taught at the specific school for more than three years. The fourth teacher who was videotaped was a young African female teacher who replaced the Science teacher when she took an unexpected leave of absence. During the pilot study this replacement teacher had initially been employed as a joint facilitator for the primary participant and another Grade 8 learner. Teachers A and B were over 50 years of age, teacher C was between 30 and 40 years of age and teacher D was under thirty years of age.

4.5.4 Ethical Issues

4.5.4.1 In relation to the primary research participant

Informed voluntary consent was obtained from the primary research participant. The identity of the adolescent who used AAC was protected and he is only referred to as S.E. The nature and purpose of the study were explained to him and he was assured that he could withdraw from the study at any point. Ongoing collaboration with the primary research participant took place with respect to all applicable research issues including data collection procedures, the content of the training programme and the implications of the research findings. His parents, academic and support staff were also consulted. In addition, written consent was obtained from his parents, the principal of the school and the KwaZulu-Natal Education Department. The video technician signed a contract of confidentiality as did the inter-raters.

4.5.4.2 With respect to the peers

Signed parental consent was obtained for both the peer training programme and the evaluation processes. The project was fully explained in an interview with the school principal and a written proposal was provided to both the school principal and the KwaZulu-Natal Education Authority.

4.5.4.3 With respect to the teachers

Only teachers who volunteered to be videotaped were filmed. The content of the interviews and videotapes was treated as private and confidential and only analysed data was reported.

4.5.5 Equipment and Materials

4.5.5.1 Video-recorder

The videotapes of the class were recorded on TDK Mini Digital videotapes using a Sharp Digital Video camera; model VLPD6H, which was used with an additional super cardiode directional microphone to ensure audio clarity of interactions of the primary research participant.

4.5.5.2 Audio tape recorder

A Sony M-430 micro-cassette recorder was used to record the teacher, parental and research participant interviews on high quality TDK micro-cassette tapes for later transcription.

4.5.5.3 Multidimensional self concept scale

This test was one of two self concept scales selected in the absence of South African standardized self concept scales. The American age for Grade corresponds closely to the South Africa norm and the English speaking contexts are similar. However, results should still be interpreted with caution. The scale was also selected and adapted for ease of completion by the adolescent who used AAC as no comprehensive self concept scales have been developed or standardized for adolescents who use AAC systems.

The psychometric properties of internal consistency and stability were considered to be most relevant. The alpha coefficients for the individual scales and total scale of the MSCS for grade 7 pupil and the total sample (grades 5 to 12) range from .97 to .99 for the full scale and .85 to .97 for the subscales. Test/ re-test reliability of .90 was demonstrated for the full scale over a 4-week period (Bracken, 1992).

An additional measure, the standard error of measurement (SEM) was employed and the SEM's are quoted as 4.74 for the Social, 5.40 for the Competence, 3.97 for the Affect, 4.5 for the Academic, 2.6 for the Family, 4.24 for the Physical and 2.12 for the total scale (Bracken, 1992). The SEM is directly proportional to the scale's reliability with the lowest score indicating the greatest reliability (Bracken, 1992).

Both norm referenced and ipsative interpretation of test scores is possible. Norm referenced refers to the evaluation of an individual's test performance contrasted with that of peers and ipsative interpretation contrasts the individual's performance on each individual scale with his or her overall performance on the test (Bracken, 1992).

To enable the primary research participant to independently complete the MSCS it was formatted as a Word document and downloaded onto his home computer. This enabled the research participant to independently read and respond to each statement. He indicated his response by changing his selection to bold type using his headpointer to access the computer keyboard.

4.5.5.4 Self description questionnaire II

Psychometrically the SDQ II was reported by Marsh (1992) to have internal consistency reliability coefficients ranging from .83 to .91 and a mean alpha for the 11 scales of .87. Test/re-test reliability based on a small sample at seven weeks ranged from .73 to .88 with an overall mean coefficient of .80. According to Marsh (1992) strong support for the construct validity of the SDQ II was demonstrated. Standard errors of measurement (SEM) of the *T* scores range from 3.0 (Physical Appearance) to 4.1 (Emotional stability) and the standard error is 2.4 for the total concept scale.

To enable the primary research participant to independently complete the SDQ II it was formatted as a Word document and downloaded onto his home computer. This enabled the research participant to independently read and complete the questionnaire. He indicated his response by typing an 'X' in the selected column using his headpointer to access the computer keyboard.

4.5.5.5 Partners in augmentative communication training rating scale

This scale was briefly discussed in 3.2.1.2. The rating scales were not designed as pre and post measures but rather as a way to highlight conflicting child and partner attitudes or perceptions as a basis for further investigation (Culp & Carlisle, 1988). For the purposes of this study the scales were adapted by the researcher for use by the adolescent who used AAC, his peers, teachers and parents. The purpose of the rating scales was to evaluate the attitudinal patterns between the adolescent who used AAC and his peer partners and also the perceptions of his teachers and parents regarding his communication with his peer partners. Statements included items regarding the attitudes of his peers, parents and teachers to his communication using speech as well as his communication using his DeltaTalker™. The PACT scales were presented both before and after the peer training to review any possible changes in the attitudes of the adolescent who used AAC, his peers, teachers and parents. Statements related to the use of speech and the VOCA for communication by the adolescent who used AAC. Four copies of the PACT peer rating scale were printed in enlarged format for the Grade 8 learners with visual impairments.

4.5.5.6 Peer nominations

Procedures used for the peer nominations and friendship rankings were based on those described by Gresham and Little (1993) in their review of peer-referenced assessment strategies. The method of peer nominations involving multiple criteria as opposed to a single criterion was selected as this improves the reliability and validity of the results (Gresham & Little, 1993). Three of the statements required nominations related to academic roles and five were related to aspects of social closeness (see Appendix A). A fixed-choice procedure with three nominations was specified for seven of the questions and a single nomination for one question was used. No negative evaluations were required. The statements used for the peer nominations were evaluated by two Grade 8 teachers as being appropriate and relevant to the experiences of Grade 8 learners. Two English language teachers including the class English teacher also rated the vocabulary and language as being well within the reading ability and understanding of Grade 8 learners. Four copies of the nomination forms were printed in large format to facilitate completion by the learners with visual impairments.

4.5.5.7 Interviews

Interviews, as referred to in chapter 3, were conducted by the researcher with the adolescent who used AAC, his teachers and parents. Interviews were held pre and post intervention and the focused interview format was adopted to meet the following criteria:

i. Specific issues relating to the social interaction and communication skills of the primary participant could be addressed. Topics were pre-determined by the researcher and open ended questions were formulated prior to the interviews. Additional questions relating to the personality and attitudes of the main participant were formulated for the pre-intervention interviews with parents and teachers.

ii. The format allowed for follow-up probes relating both to topics that were pre-determined by the researcher and to issues raised by the interviewees.

Interviews were conducted individually with the primary participant and his parents at their home. Interviews with each parent lasted between 30 and 35 minutes. The pre and post intervention interviews with the main participant lasted 40 and 42 minutes respectively. The interviews with the teachers took place during recess in the school waiting room or empty classrooms at times designated by the teachers and lasted between 25 and 30 minutes. All the interviews were audiotaped and transcribed verbatim.

4.5.6 The Peer Training Programme

The study required the development of an eight-week peer training programme. The detailed rationale was described in Chapter 2.

4.5.6.1 The theoretical basis for the peer training programme

The theoretical basis for principles that could apply to a peer training programme was presented in Table 2.1. The application of the selected principles in the current study is presented in Table 4.4.

Table 4.4 The underlying principles and their application in the programme

Principles	Application
Social modeling involves the practice of teaching a behavior by presenting a model to be observed and imitated. (Cartledge & Milburn, 1995).	The researcher modeled ways to interact with the AAC user and methods to clarify his messages during the progress of the workshops. Using excerpts of the videotape "Face to Face" showed unfamiliar peers modeling specific interaction strategies.
Behavior rehearsal is considered crucial to ensure that social skills, including communication skills, are learnt effectively (Cartledge & Milburn, 1995).	After skills had been introduced and demonstrated activities were structured to enable the peers to practise these skills e.g. after introducing taking conversational turns (turnabouts) learners practised the skill using topic cards.
Eliciting observations and potential solutions is a far more effective way to learn new behaviours than if they were suggested by the researcher (Hess 1993).	Open-ended questions were used to elicit comments. Any contribution was validated and through the process of reflecting the comment back to another student the group discovery process was facilitated.
Adolescents learn and maintain behaviour far better when cognitive understanding is engendered (Bandura, 1977; Cartledge & Milburn, 1995).	Throughout the sessions group discussions were facilitated to facilitate meta-communication skills by asking learners to define "conversation", the "tasks of the speaking partner", "contingent questions" an so forth. In addition the pertinence of each of the target skills was verified through group discussions to encourage the participants to attach relevance to the skill and so improve motivation
Using games is an effective tool to increase rapport with adolescents and to improve their effort in learning social skills (Malouff & Schutte, 1998).	Games were used frequently during the programme e.g. "the common pool" a game devised by Malouff and Schutte (1998) to enhance peer cooperation
Problem solving is an important component in promoting supportive peer relations and a necessary means to promote social cognition (Rose, 1998).	Many of the discussions required the peers to identify both problems and their possible solutions.
Short term groups with a specific goal are suitable for developing skills and are time efficient (Rose, 1998).	Eight, 50-minute sessions were planned to teach specific interaction skills to the peers of the Grade 8 learner who uses AAC.

4.5.6.2 Group strategies to promote cohesiveness.

The rationale behind the use of these strategies was discussed in chapter 2. Circle seating was used during group discussion times. The use of the technique "rounds" proved an effective strategy in facilitating sharing and self discovery and required structured turn taking. As each person knew they would have a turn there was less pressure and few interruptions. "Brainstorming" was used to encourage increased awareness of, and possible solutions for, the difficulties experienced by the peer with LNFS.

4.5.6.3 The goals of the peer training

The goals of the peer training were determined by the difficulties the adolescent who used AAC identified in his interactions with his peer group. The identified difficulties were matched with the desired interaction behaviours of peers as in Table 4.5 below.

Table 4.5 Issues of communication and desired behaviours of peers

	Difficulties Identified by the Adolescent who used AAC	Desirable Interaction Behaviours of peers
i	Inadequate time was given to him to formulate what he wanted to say during small group discussions, especially when using the DeltaTalker™.	Peers to be more aware of the time taken to interact using AAC strategies and to allow time for the adolescent who uses AAC to formulate messages especially when using the DeltaTalker™.
ii.	Insufficient opportunities to initiate interactions about topics of concern	Increasing awareness of their behaviours that block conversations with the adolescent who uses AAC. Improved listening and negotiation skills.
iii.	Peers often addressed the adolescent who uses AAC and asked him a question but left before he could answer their questions.	Peers to learn the strategy of waiting for a response from the adolescent who uses AAC.
iv.	Peers pretended to understand his message when they had not done so.	Increase peers' awareness of how frustrating it is for a person not to be understood. Peers to learn importance of telling the adolescent who uses AAC that they have not understood him and to learn methods to assist in clarification of his messages.
v.	Certain class peers avoided talking to him	Increasing peers' awareness of the difficulties of using AAC and strategies of co-operation. Researcher to model interactive behaviours and validation of the adolescent who uses AAC.
vi.	Peers sometimes addressed him as if he was far younger than they were and for example, one peer would pat him on the head	Peers to be made aware of the frustration of the adolescent who uses AAC with these behaviours and to facilitate more mature interactional strategies including conversation maintenance, increasing the frequency and quality of contingent questions and comments etc.
vii.	Peers become distracted, "sidetracked" by other peers while chatting to him.	Peers to learn strategy of waiting for adolescent who uses AAC to complete message and to improve listening skills.
viii.	Peers interrupted him and certain peers, chiefly some of the girls, completed his messages for him, often incorrectly	Peers to learn strategy of asking whether they may complete the message for the adolescent who uses AAC for him and the strategy of clarifying whether they have completed the message correctly.
ix.	Peers avoid him at breaktime leading to intense feelings of loneliness.	Through group processes and activities to encourage interaction and facilitate possible friendships between the adolescent who uses AAC and liked peers.

	Difficulties Identified by the Adolescent who used AAC	**Desirable Interaction Behaviours of peers**
x	Peers used his computer without requesting that they may do so.	Peers to learn to ask the adolescent who uses AAC, just as they would another peer, whether they might use his computer. Peers to be more aware of the way the adolescent who uses AAC expressed emotions and to respond appropriately to him.
xi	Peers were not taking the adolescent who uses AAC seriously and did not validate his contribution.	Peers to develop strategies for reaching consensus in group activities and to learn to give due consideration to his contributions to group discussions.

4.5.6.4 The structure of the communication workshops

The peer training programme consisted of eight workshops of 50 minutes in duration, the set length of one school period. The objectives were grouped according to specific goals and themes so that each workshop formed a cohesive unit. The units included:

i. Conversation: Turnabouts
ii. Behaviours that block communication
iii. Listening skills
iv. Conversation maintenance
v. Group consensus
vi. Feedback and Clarification and
vii. Rate Enhancement and negotiation.

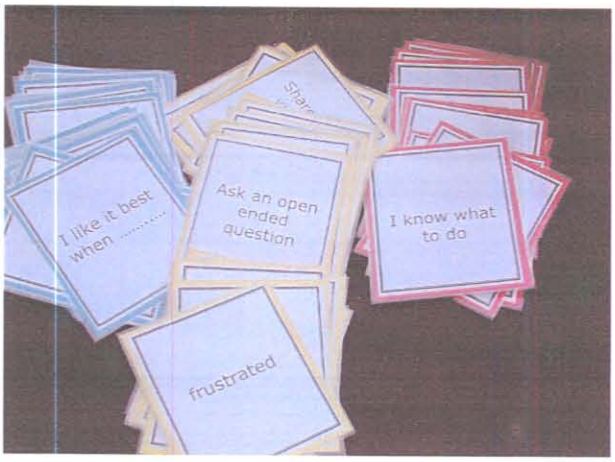
The final workshop included activities to recall and review aspects of the previous seven workshops. Each workshop was planned according to the following structure:

- Objectives
- Activity Sequence
- Materials Required
- Detailed Procedures including a closure activity for the end of each session.

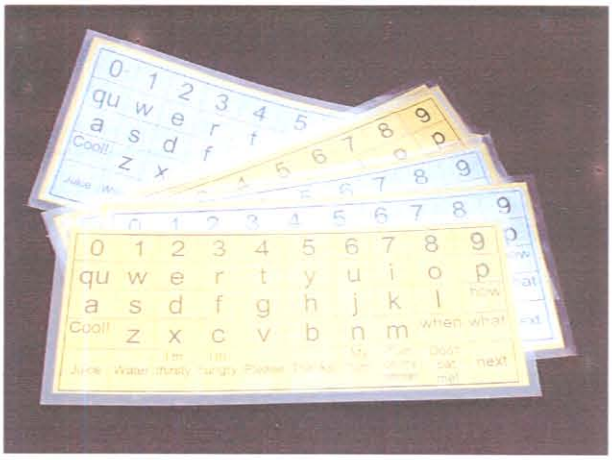
(See Appendix B for communication workshop planners 1-7).

4.5.6.5 The materials used in the communication workshops

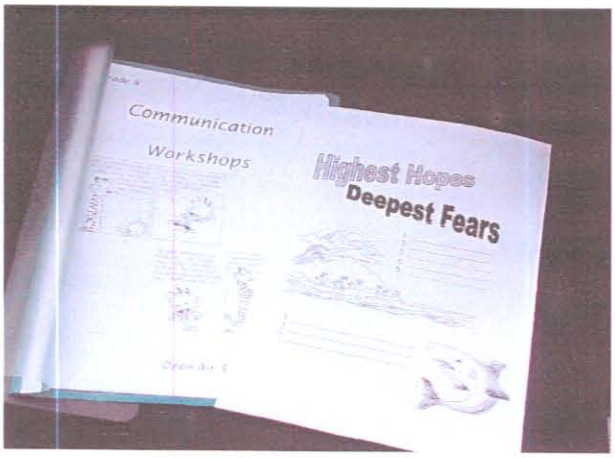
The required materials included worksheets, cards and other materials that were prepared by the researcher. These materials were carefully designed, multi-coloured, attractive, well presented and suitable for the adolescents with normal visual functioning as well as those with visual impairments. Some of the materials are shown in the following photographs.


I like it best when ....
Ask an open ended question
I know what to do
frustrated

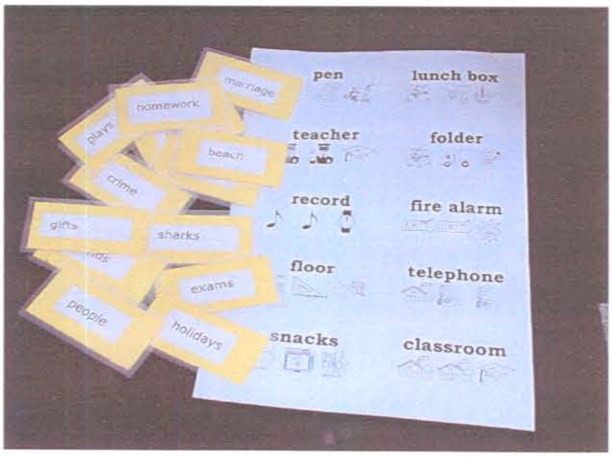
Photograph 1. Materials made for the peer training programme including the following cards: (i) unfinished sentences,
(ii) emotions, (iii) contingent responses and
(iv) statements.


0 1 2 3 4 5 6 7 8 9
qu w e r t y u i o p
a s d f g h j k l
Cool! z x c v b n m
when what how
next

Photograph 2. Alphabet and word communication boards.


Communication Workshops
Highest Hopes Deepest Fears

Photograph 3. Additional materials showing copy of handout and a worksheet.


marriage
homework
plays
beach
crime
gifts
sharks
exams
people
holidays
pen
lunch box
teacher
folder
record
fire alarm
floor
telephone
snacks
classroom

Photograph 4. Topic cards and minspeak symbol sheet.

The desired interactive behaviours and the additional outcomes of facilitating group cohesiveness and promoting more positive, friendlier interactions between the peers were integral to the programme. At the beginning of the first workshop each student was required to introduce himself or herself and give one goal of what he or she hoped to achieve after matric. At the beginning of each subsequent workshop a quick recap of the previous unit took place. Handouts were prepared after the workshops and related specifically to what had taken place in the group. Contributions were recorded in a personal way mentioning the specific adolescent's name so that they would be more motivated to read the handouts and would identify more closely with the material. Each handout was headed Communication Workshop and the relevant number followed by the date, the names of the Grade 8 participants for that session (this served as a record of which peers had attended each session). A description of the main topic(s) included a discussion of what had transpired during each session. The handouts were kept short, 1 or 2 pages (see Appendix C for a sample handout). Three were illustrated. The front cover included an appropriate cartoon and each pupil was provided with an attractive folder with his or her name on it in which they filed the handouts for future reference. Four copies of the handouts were printed in large type for the learners who had visual impairments.

4.5.6.6 Summary of the peer training programme

The specific goals, aims, procedures and materials used in the peer training programme are summarised in Table 4.6.

Table 4.6 The objectives, procedures and materials of the peer programme

Objectives	Procedures	Materials
Increase peers' awareness of how long it takes to formulate a message (communication turn) using AAC including the DeltaTalker ™	i. Discussion of interaction with the adolescent who used AAC in class highlighting the need to give the adolescent who used AAC time to formulate his message ii. In pairs, using an alphabet communication board to speak and to "listen" to the other person by "reading" the message as it is spelled out. Topics and pairs changed after 5 minutes. iii. Building Minspeak sentences iv. Contest between adolescent who uses AAC and "the rest of Grade 8" in building learnt sequences for specific vocabulary	Flip chart Alphabet communication boards and straws Minspeak icon cards from BUILLD™
Peers to learn strategy of waiting for a response from the adolescent who uses AAC.	i. Discussion of interaction with the adolescent who uses AAC in class highlighting the need to give the adolescent who uses AAC time to formulate his message ii. In pairs, each to use an alphabet communication board to speak and to "listen" to the other person by "reading" the message as it is spelled out. Topics and pairs changed after 5 minutes.	Flip chart Alphabet communication boards and straws Topic cards
Learners to be able to identify "turnabouts" in conversations	i. Class asked to define "conversation" From this an explanation and discussion of turnabouts was facilitated. ii. Identification of turnabouts by students while watching segments 1& 3 of the video "Face to Face". iii. Practice in using turnabouts as described.	Flip chart Face to face video
Learners to identify behaviours that block conversation	i. Identification of behaviours that block conversation following viewing of segments 2& 4 of the "Face to Face" video. ii. Circle discussion on identified behaviours that block interaction	Flip chart
Learners to recap and practice "turnabout" behaviours taking equal responsibility to continue the interaction	i. Students to interact in dyads by finding out 5 facts about each other's interests, family etc. ii. Feedback of each student about the partner's interest, family etc.	None
Increase awareness of peers that not waiting for a reply from the adolescent who uses AAC is unfriendly and leads to the adolescent who uses AAC feeling frustrated and rejected.	i. Discussion of conversation blocking behaviours as related to interactions with the adolescent who uses AAC.	None

Objectives	Procedures	Materials
Increase peer's awareness that turning away from the adolescent who uses AAC and not responding limits interactions	i. Discussion of conversation blocking behaviours as related to interactions with the adolescent who uses AAC.	Flipchart
Students to identify good listening skills Students to determine how good listening skills facilitate conversation	i. Brainstorm session on good listening skills and why these facilitate conversation ii. Identify poor listener in segment from Face to Face video	Flipchart
Increase peer's awareness of how frustrating it is for the adolescent who uses AAC not to be understood	i. "I can't understand" you – game format ii. "The opposite" – game format. iii. Discussion on the games and the feelings they engendered iv. "Broken telephone" – game format	None
Peers to learn to signal the adolescent who uses AAC that they have not understood a particular message	i. Discussion to elicit ways to signal the adolescent who uses AAC that he has not been understood. ii. Discussion on positive ways to ensure the adolescent who uses AAC is understood during the following week.	None
Learners to identify and practise making contingent comments	i. Brainstorm on how to keep topics of conversation going ii. Praise Bombardment iii. Kaleidoscope card game – game format	Two decks of cards: One with unfinished sentences One with strategies for contingent comments e.g. add something to the topic, share an experience etc,
Peers to learn to increase the frequency and quality of contingent comments when interacting with the adolescent who uses AAC	i. Fun activity using quiz format about strategies and examples of contingent comments	None
Peers to learn the strategy of asking open-ended questions during conversations with the adolescent who uses AAC	i. Watching of segment 5 of Face to Face video to introduce contingent questions ii. Discussion to elicit identification of open-ended questions iii. Following praise bombardment everyone to ask adolescent who uses AAC contingent question related to himself	Face to Face video Flip chart
Students to identify and develop strategies for reaching consensus in group activities	i. Viewing segments 26 & 27 of the Face to Face video	Face to face video

Objectives	Procedures	Materials
Students to learn the value of cooperation	i. The Common Pool – game format ii. Discussion on competitiveness and cooperation following the common pool game	1c coins
Peers to learn to ask for clarification if they do not understand the adolescent who uses AAC	i. Discussion and role play activity	None
Peers to learn the strategy of offering to facilitate the use of the VOCA for clarification	i. Modelling of "Would you like to use your DeltaTalker™ as I do not understand?"	None
Learners to identify how to provide feedback during conversations. Emphasis on reflecting emotional feelings.	i. Completion of "Highest Hopes/ Deepest Fears" worksheet in dyads. ii. Roleplay of different emotions activity iii. Discussion of feedback strategies and how changing the emotional tone of a statement can change the meaning	Highest Hopes/Deepest Fears worksheets 2 sets of cards – one set with simple statements, the second set with different emotions
Peers to learn to ask the adolescent who uses AAC whether they may guess the message he is formulating	i. Unfinished sentence activity	Unfinished sentence cards
Peers to learn to confirm whether they have correctly anticipated the message being formulated.	i. Unfinished sentence activity ii. "What is my future" – panel discussion game	Unfinished sentence cards
Peers to learn the rate enhancement strategy of asking yes/no questions in appropriate settings.	i. "What is my future?" – panel discussion game	None
Learners to identify behaviours that result in successful and unsuccessful negotiation with a peer	i. Viewing of segments 7 & 8 of Face to Face Video ii. "Rounds discussion" iii. 'Well of unfinished sentences': Activity involving negotiation in pairs	Face to Face video Flipchart

4.5.6.7 The Evaluation of the Peer Training Programme

The effectiveness of the peer training was ultimately evaluated in terms of the changes noted in the social interaction of the adolescent who uses AAC. Evaluation of this functional outcome is discussed fully in the data analysis section, section 4.5.8 of this chapter. These measures determined whether the peer training programme reached its proposed outcome. In addition the programme needed to be evaluated in terms of whether the specific objectives of the peer training programme were met. Strategies included the focus interviews, socio metric measures and the analysis of the responses on the PACT partner rating scales. Systematic evaluation of the process of the peer training programme was also to be determined. For this purpose a member of the professional school staff, a Speech and Language Therapist, was requested to evaluate independently whether the aims and objectives of each communication workshop were achieved.

4.5.7 Data Collection Procedures

4.5.7.1 Videotaping of interactions

The videotaping took place in the classroom during the normal school timetable. Filming was carried out during the teaching periods of three teachers across four school subjects, English, Drama, Human Social Studies and Science. This strategy allowed for varied peer interaction opportunities, which were rated by the head of department for Grade 8 as being representative of typical interaction opportunities throughout the normal school programme. The video technician was positioned near the open door of the classroom and gave the appearance of filming the entire class although the camera was focused on the adolescent who used AAC.

The videotapes were then viewed repeatedly and transcribed verbatim according to the notation and transcription principles discussed in chapter 3. Further viewing resulted in the coding procedures being applied. Any interactions not readily understood by the researcher were then shown to the primary participant who clarified the content and intent of ambiguous interactions. Twelve percent of the videotapes were re-coded after an interval of twelve weeks to establish intra-rater reliability. Two qualified Speech and Language Therapists independently coded 12% of the videotapes to establish inter-rater reliability.

Table 4.7 reflects the dates and duration of the filming of the videotapes

Table 4.7 Record of filming of the videotapes

Phase of Research	Tape	Date	Duration	Teacher
Pre-intervention	1P	22.03.2001	42 minutes	A
Pre-intervention	2P	23.03.2001	52 minutes	A
Pre-intervention	3P	23.03.2001	40 minutes	C
Pre-intervention	4P	02.04.2001	47 minutes	B
Pre-intervention	5P	03.04.2001	52 minutes	B
Pre-intervention	6P	20.04.2001	46 minutes	C
Intervention Phase	1I	04.05.2001	48 minutes	C
Intervention Phase	2I	07.05.2001	54 minutes	A
Intervention Phase	3I	22.05.2001	58 minutes	A
Intervention Phase	4I	22.05.2001	46 minutes	C
Intervention Phase	5I	23.05.2001	41 minutes	C
Intervention Phase	6I	08.06.2001	30 minutes	A
Intervention Phase	7I	12.06.2001	54 minutes	B
Intervention Phase	8I	18.06.2001	54 minutes	A
Post Intervention Phase	1A	25.06.2001	58 minutes	D
Post Intervention Phase	2A	25.06.2001	50 minutes	B
Post Intervention Phase	3A	26.06.2001	52 minutes	B
Post Intervention Phase	4A	27.06.2001	40 minutes	B
Post Intervention Phase	5A	27.06.2001	46 minutes	A
Post Intervention Phase	6A	27.06.2001	48 minutes	D
Post Withdrawal Phase	1W	15.08.2001	48 minutes	B
Post Withdrawal Phase	2W	15.08.2001	52 minutes	A
Post Withdrawal Phase	3W	15.08.2001	42 minutes	D
Post Withdrawal Phase	4W	21.08.2001	48 minutes	A
Post Withdrawal Phase	5W	21.08.2001	50 minutes	D
Post Withdrawal Phase	6W	22.08.2001	46 minutes	A

4.5.7.2 Peer nominations and peer PACT scales

The peer nominations and PACT peer rating scales were completed in class as part of the normal curriculum. They were presented to the class by the English teacher to reduce any possible bias and were completed as part of the English curriculum on “completing documents”. Specific printed instructions were supplied to the teacher (see Appendix D). The teacher read these instructions to the class verbatim. Absences due to illness resulted in 11 peers completing the PACT partner scales in both the pre intervention phase and post intervention phases.

4.5.7.3 Self concept scales

The completion of the MSCS and SDQ II took place at the primary participant's home during two separate sessions. Both the MSCS and the SDQ II were typed on computer using Microsoft Word and downloaded on disk so that the adolescent who used AAC could complete them independently. The researcher sat quietly in the same room as the adolescent so that she was readily available to answer any queries. During the pre-training session the primary participant queried the meaning of only one statement on the SDQ II.

4.5.7.4 Interviews

The pre and post training interviews with the main participant were completed at his home. A flexible approach was adopted and after an initial open ended question the researcher allowed him to introduce topics and concerns. The parental interviews also took place at their family home during weekends and the parents completed the PACT parental rating scales during the same meetings. Although the researcher had outlined a series of possible questions for the parents, a flexible approach was adopted and the researcher picked up on issues and comments of the parents. In this way the researcher was able to listen to and respond to the parents, facilitating a more in-depth interview.

The teacher interviews took place in the school waiting room or in an empty classroom during recess periods and the teachers completed the PACT partner schedules after school. Several open ended questions and topics had been pre-selected by the researcher to facilitate the interviews with the teachers. However, these were not rigidly adhered to and the researcher adopted a friendly and relaxed approach, encouraging the teachers to express their own concerns and to voice their opinions. Teacher C was replaced by teacher D due to an unexpected leave of absence resulting in the pre and post interviews being conducted with different individuals as depicted in Table 4.7. All of the interviews were audio recorded for later transcription and analysis. During the pre intervention interviews with the teachers and parents information was also elicited about the personality of the primary participant. The process of the pre and post measures is reflected in Table 4.8.

Table 4.8 Process of pre and post measures.

Measurement	Participants	Pre intervention	Post Intervention
Multidimensional Self Concept Scale	Main participant	18.03.2001	09.07.2001
Self Description Questionnaire 11	Main participant	25.03.2001	10.07.2001
Peer nominations and Rankings	Peers	04.04.2001	20.06.2001
Adapted PACT scales	Main participant and Peers	04.04.2001	20.06.2001
Adapted PACT scales	Teacher	23.03.2001	22.06.2001
Adapted PACT scales	Parents	24.03.2001	15.07.2001
Interview	User	24.03.2001	29.06.2001
Interview	Teacher A	19.03.2001	27.06.2001
Interview	Teacher B	03.04.2001	27.06.2001
Interview	Teacher C	26.03.2001	
Interview	Teacher D		26.06.2001
Interview	Parents	25.03.2001	29.06.2001

4.5.8 Data Analysis

4.5.8.1 The analysis of the videotape transcriptions

The duration of each videotape was calculated. Each videotape was divided into 2-minute segments. Each 2-minute segment was coded according to one of three contexts that occurred within the classroom; teacher directed context, small group OBE context and informal time context.

Each videotape was then analysed as follows:

i. The total time of each context i.e. teacher directed, OBE small group and informal context was calculated in minutes and expressed as a percentage of the total time of the videotape.
ii. The frequency of interactions was calculated by totaling the number of messages per hour for each context represented. Messages included those of the adolescent who uses AAC and the peer(s) who interacted with him.

iii. The mean number of messages per interchange was calculated by adding the number of messages per interchange and dividing the total by the number of interchanges.

Each message was then further analysed according to the discourse structure, the communication function and the mode used by the main participant as well as the response of the partner according to parameters as reflected in Table 4.9.

Table 4.9 Description of the divisions of each category and the coding structure

Category	Division	Code	Description
Discourse Function	Initiation of interaction	1	Irrespective of mode, the primary participant initiates an interaction with a peer(s). Initiation contains discernible message. Coded whether peer(s) respond or not.
	Re-initiation of interaction	2	The adolescent who uses AAC repeats initiation a second time. Only coded if peer did not respond to initial interaction attempt.
	Response by main participant to peer(s).	3	The primary participant responds to an initiation of interaction by a peer(s).
	Discourse Maintainer	4	The primary participant responds to a previous message of peer(s), or continues his turn with a new message. The message may introduce a new topic or serve any other communicative function.
Communication Function	Social Greeting	1	The primary participant initiates a greeting or meets any socially expected norm of response to a peer(s)
	Answers yes/no question	2	Irrespective of the mode used the adolescent who uses AAC answers 'yes' or 'no' to a question of a peer(s).
	Answers open ended question	3	Gives response using any mode to an open ended question of a peer(s).
	Requests information Asks questions	4	The primary participant, irrespective of mode, asks for assistance, asks a question or with respect to a specific need requests some form of information from a peer(s).
	Offers Information	5	The primary participant, irrespective of mode, gives information, whether in response to the question of a peer(s) or spontaneously.
	Gives Opinion	6	This pragmatic skill suggests the primary participant knows his partner's perspective and voices his opinion on the topic of discourse.
	Expresses feelings or emotions	7	Where the message is used chiefly by the primary participant to express feelings or emotion.
	Teases or pretends (humour)	8	Any form of joking or interacting in a teasing or playful manner. Includes sarcasm
	Interrupts conversation	9	Deliberately and successfully interjects or interrupts the conversation of peers.

Category	Division	Code	Description
Mode of Communication	Natural voice: Vocalisation Verbalisation	1	Any sound, word or word approximation, made by the primary participant with the intention of communicating a specific message.
	Facial Expression	2	Use of facial expressions as the primary means of communicating a message.
	Body movement	3	Deliberate movements of a body part to signal a message.
	DeltaTalker™	4	Formulation and activation of a message using his VOCA.
	Eye-gaze/eye pointing	5	Use of eyes as primary means of expressing a message to peer(s).
	Computer	6	Uses computer to type a message to a peer(s).
Partner responses	Initiation of interaction by a peer or peers	1	Irrespective of mode a peer initiates an interaction with the primary participant. Initiation contains a discernible message.
	Peer partner responds appropriately	2	Any response that is an appropriate response to the message or initiation of an interchange by the primary participant
	Partner ignores adolescent who uses AAC	3	Partner ignores interactional behaviour of the adolescent who uses AAC
	Discourse maintainer	4	A peer partner or partners respond to a previous message of the adolescent who uses AAC or continues his/her turn with a new message. The message may introduce a new topic or serve any other communicative function.
	Partner clarifies message of the adolescent who uses AAC	5	Peer clarifies a message of the adolescent who uses AAC irrespective of the strategy used e.g. by repeating the message, or asking a question to clarify the message.
	Partner does not understand the adolescent who uses AAC	6	Partner clearly does not understand the message. May indicate he/she has not understood by asking e.g. "what?"

Further analysis included:

i. The number of occurrences for each of the codes within the category of discourse function were totaled for the main participant. These were converted and expressed as the number of occurrences per hour within each context for each phase of the research process. This was to allow for comparison of the frequency of each discourse structure across the phases of research. The formula used was:

$$\frac{\text{Number of Occurrences X } 60}{\text{Sample Time in Minutes}}$$

ii. This process was repeated for each of the codes within the categories of communication function and modes of communication used by the primary participant.

iii. Similarly, the number of occurrences for each code of partner response was totaled and formulated in the same way for evaluative comparison. .

4.5.8.2 The analysis of the multidimensional self concept scale

Scoring procedures were followed as directed by the manual. Differential scoring of positive and negative items was necessary (Bracken, 1992). Standard scores were determined for the total score and the six scales. The level of confidence of 90% was selected for reporting the respective confidence level intervals for the standard score for each of the six scales and the total score. The score classification, a descriptive classification of the extent of positive or negative self concept indicated on each of the six scales and the total scale, was determined. Percentile rank determinations completed the norm-referenced analysis of the MSCS. In addition, the ipsative analysis was completed to reflect personal weaknesses and strengths of the primary participant using his overall level of adjustment as the point of reference. The ipsative analysis gave an improved indication of the pattern of adjustment of the primary participant (Bracken, 1992). This was completed by determining the discrepancy level at the .05 alpha level and recording in the descriptive classification column whether each sub-scale was ipsatively a strength, weakness or average.

4.5.8.3 The analysis of the self description questionnaire II

Raw scores were converted to percentiles and *T* scores as per the instructions in the test manual. Percentile and *T*-score equivalents for the individual scale scores and the total self concept scores were recorded.

4.5.8.4 The analysis of the PACT scales

The PACT rating scales were used to determine patterns of attitudes and perceptions of attitudes between the adolescent who uses AAC and his peers relating to his use of speech and his DeltaTalker™. Comparisons of attitudes reported pre and post training were used to determine if there was any qualitative change following the peer training. The pre- and post- intervention rating scales of the primary participant were also compared to identify any qualitative changes in his attitudes or in his perceptions of his peers' attitudes toward his speech and use of his VOCA.

The attitudes of his parents and teachers to communicating with the primary participant and their perceptions of his communication with his peers were also compared to his attitudes and perceptions. Qualitative changes as reflected in the responses of his parents and teachers before and after the intervention phase were noted.

4.5.8.5 The analysis of the peer nominations

The number of nominations per learner in the class were simply tallied and then compared as the greater the number of nominations, the more popular the learner i.e. the higher the social status of the learner (Gresham & Little, 1993). Pre and post intervention results were also compared to note if there was any major difference in socio-metric status of the main participant.

4.5.8.6 The analysis of the audiotape transcriptions of interviews

After the interviews had been transcribed verbatim the researcher delineated themes and made tentative conclusions. The transcripts were then handed to an inter-rater, a doctoral graduate and researcher in language and AAC, who was asked to independently develop themes and make deductions. Having separately defined themes, the researcher and inter-rater met and reviewed the theme analysis. In the same way tentative conclusions were discussed, cross checked and then verified with constant reference to the original transcripts. Only when there was agreement between both the researcher and the inter-rater were conclusions about changes in pre and post training interviews tabulated. This process was followed to minimise misinterpretation of interview data and to improve the validity of the findings.

4.5.9 Data Presentation

Overall main effects are presented diagrammatically.

4.5.9.1 Presentation of data from the videotapes

To allow for an overview and comparison across the different phases of the research the results of the above procedures were presented in a composite table for each specific context. To allow closer scrutiny coloured bar graphs were prepared for each category within each context. In these graphs the y-axis represents the number of occurrences per hour and the x-axis represents the different codes within each category across the different phases of the research. In addition line graphs were prepared comparing the occurrences of each code of each category at the various stages of research. In these graphs the y-axis represented the number of occurrences per hour and the x-axis represented the different phases of research.

4.5.9.2 Presentation of the data of the self concept scales

The results of the main participant on the MSCS including the norm-referenced standard scores, classification and percentile rank for each scale, and the total and average scale score are presented in table format as were the ipsative results. Pre and post intervention results are presented in separate tables but for comparative purposes the norm-referenced profile of the main participant on the MSCS both at pre and post intervention phases was presented graphically.

The results pre and post intervention of the primary participant on the SDQ ll were presented in a single table reflecting percentiles and *T* scores for each scale and the total self concept score. The *T*-score results were represented graphically for easier comparison of pre and post intervention findings.

4.5.9.3 Presentation of the PACT rating scale data

To compare the primary participant's responses a table showing his pre and post intervention scores was prepared. Pertinent changes were discussed. Pre intervention and post intervention summary sheets were prepared tabulating the results of the primary participant and the peers. Similar tables were prepared for the PACT partner results of the teachers and the parents. Tables reflecting the peer partner scores and the user scores are presented in the results. .

4.5.9.4 Data presentation of the socio-metric measures

The peer nomination results were presented in a table reflecting the total scores of the nominations for each Grade 8 learner.

4.5.9.5 Data presentation of the interview data

Tables delineating the theme, pre and post intervention comments and the resultant conclusions were completed. Tables detailing the summarised findings of the teacher and parent interviews were then prepared. The analyses of the interviews with the primary participant and his parents were presented in the text.

4.6 SUMMARY

This chapter presented the methodology used in the study. The aims of the study were followed by a brief description of the research design. The main study was discussed with reference to the primary participant, the peer group, ethical issues, the equipment and materials utilised, data collection and analysis procedures.