CHAPTER 5
RESULTS AND DISCUSSION OF RESULTS

5.1 INTRODUCTION

The results of the study are presented and discussed in this chapter. The results will be described according to the following three sections:

i. Measures to ensure the reliability of the research findings.
ii. The analysis of the observational data obtained from the transcripts of the videotapes.
iii. The analysis of results pertaining to pre and post measures.

The results were obtained from primarily two sources (i) the analysis of the observational data and (ii) the analysis of data from pre and post measures. As discussed in the methodology the observational data were used to determine whether there was any increase in the number of messages (frequency of interactions) of the primary participant and whether there was any increase in the number of messages per interchange (extent of interactions). The observational data were also used to evaluate any changes in the interactions of the primary participant with respect to the discourse functions, the communicative functions and the modes he used.

The pre and post measures were selected to investigate any changes with respect to the evaluation and perception of his communication by the primary participant himself, his peers, parents and teachers. Pre and post measures were also selected to reflect other possible changes in the psychosocial background of the primary participant including the socio-metric status of the primary participant and his degree of self confidence as reflected in standardised self concept scales. In order provide a structure for the presentation of the results a schematic overview of the main sections and their parameters are presented in Figure 5.1.

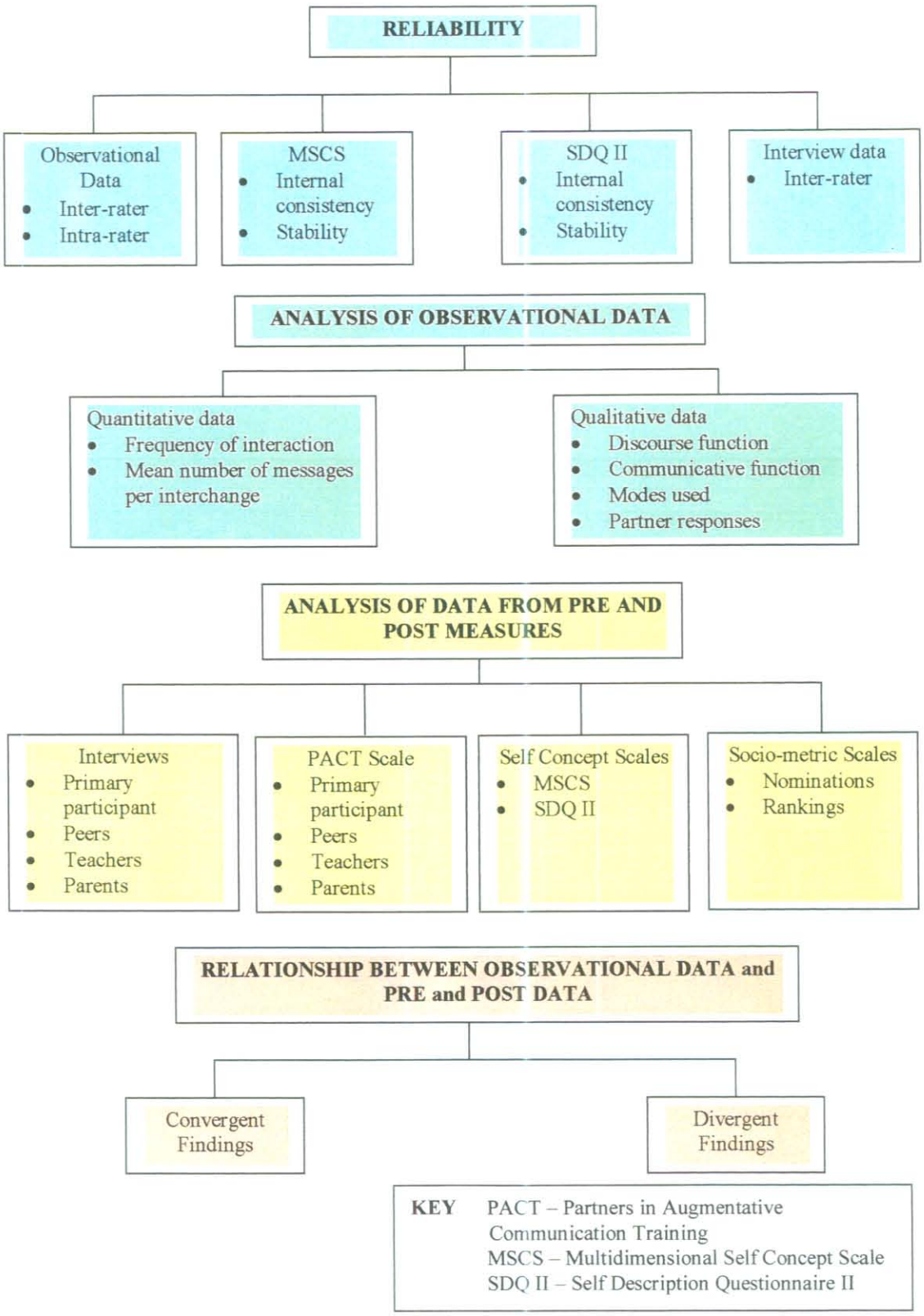

Figure 5.1 Areas of analysis of data

5.2 RELIABILITY

There are different types of reliability but they all refer to the consistency of method of measurement or the consistency of the measuring instrument (McMillan, & Schumacher, 2001). Repeatability is therefore the essence of reliability, namely will the method or instrument give the same results when subsequently administered. The consistency of observations, the type of reliability referred to as 'agreement' by McMillan and Schumacher (2001), was applicable to the observational data of the current study. The procedures used to measure this form of reliability are inter-rater and intra-rater reliability.

Two types of reliability are particularly relevant to tests and scales, namely internal consistency and stability. Internal consistency refers to the degree to which items in a test or scale correlate to the total score and is measured by means item analysis and by computing Alpha coefficients. Stability of tests over time is measured in terms of test/re-test reliability.

Reliability has also been defined as relative absence of errors of measurement (McMillan, & Schumacher, 2001). The standard error of measurement (SEM) is directly proportional to the reliability of a test so that as the SEM increases the reliability of the test decreases. Internal consistency, stability and SEM procedures were applicable to the standardised self concept scales used in the study. The measures of reliability applicable to the study are reflected in Table 5.1.

Table 5.1 Measures Used to Improve Reliability of the Research Results.

Data	Type of reliability
Videotape coding	Inter-rater reliability
	Intra-rater reliability
Multidimensional Self Concept Scale	Internal Consistency
	Stability (test/re-test reliability)
Reliability of Self Description Questionnaire II	Internal consistency
	Stability (over time)
Analysis of Audiotape recordings	Inter- rater reliability of theme identification

5.2.1 Reliability of the Coding of the Videotape Transcriptions

5.2.1.1 Intra-rater reliability

To determine how consistent rater 1, the researcher, was in the coding of the transcriptions, 22% of the videotapes were re-coded after a period of three months. The videotapes were selected to represent all phases of the research study and to include all the teachers and contexts. The rater watched the videotapes, re-coding all interactions that took place on the selected videotapes. The correlation between the ratings was 98%. The majority of the discrepancies were related to communication functions 5 and 6, namely 'offering information' and 'voicing an opinion or giving an instruction'. The intra-rater agreement on communication modes employed by the adolescent who uses AAC was 100%.

5.2.1.2 Inter-rater reliability

Two additional raters, raters 2 and 3, qualified Speech and Hearing Therapists, independently coded 22% of the videotapes. The videotapes were selected to represent all phases of the research study and to include all the teachers and contexts. The coding system was explained to raters 2 and 3 who were then trained using excerpts of two videotapes that were not included in the 22% sample. The raters (2 and 3) viewed the videotapes, coding all interactions on the selected tapes. Inter-rater agreement is reflected in Table 5.2 as a percentage of codes that were in agreement with rater 1, the researcher. The total number of messages coded for each category is reflected in the row labeled 'number of messages' in Table 5.2.

Table 5.2 Inter-rater Percentage of Agreements of Videotape Coding.

Key: R 2 = rater two, and R3 = rater three.

Videotape	Number of messages		Discourse function		Communication function		Modes used		Partner responses	
	R2	R3	R2	R3	R2	R3	R2	R3	R2	R3
Pre Intervention 3	91	100	91	100	100	91	100	96	83	92
Pre Intervention 4	100	100	94	94	88	94	100	100	100	92
Intervention 1	94	88	96	100	93	100	100	100	93	89
Intervention 8	85	90	97	100	94	88	100	100	83	94
Post intervention 5	100	100	100	98	95	88	100	100	100	95
Post withdrawal 1	100	92	97	100	89	93	99	99	98	98
Post withdrawal 2	91	91	97	97	83	97	100	100	92	96
Total % agreement	93	93	97	99	92	92	100	99	93	95
Number of messages	83/ 89	83/ 89	252/ 260	257/ 260	238/ 260	240/ 260	263/ 264	262/ 264	211/ 226	214/ 226

5.2.2 Reliability of the Self Concept Measures

Both the Multidimensional Self Concept Scale (MSCS) (Bracken, 1992) and the Self Description Questionnaire 11 (SDQ 11) (Marsh, 1990) were chosen as they were comprehensive multifaceted scales that had published psychometric characteristics. The internal consistency and stability of both tests were discussed in the methodology, 4.5.5.3 and 4.5.5.4 respectively.

Measurement error can result from undesirable environmental and other factors e.g. examinee characteristics (Bracken, 1992). In a test of this nature the independence and confidentiality experienced by the examinee would appear important. Both the MCSC and SDQ 11 were downloaded onto the home computer of the adolescent who uses AAC to allow for maximum independence and ease and to minimise potential error.

5.3 RESULTS OF THE ANALYSIS OF OBSERVATIONAL DATA

The primary aim of the research was to determine whether training the peers would influence the interactions of the adolescent who uses AAC. Both quantitative and qualitative changes needed to be recorded and analysed. The most direct method of doing so was through videotaping the adolescent who uses AAC interacting with his peers in the natural context of school throughout the phases of the research. The videotapes were then transcribed and the transcriptions coded and analysed (see Appendix E for sample transcript of videotape, post withdrawal 3). The parameters according to which the observational data were analysed are presented in Table 5.3.

Table 5.3 Schematic Overview of Observational Data Analysis

Phases of Research	Measuring Instruments	Parameters
Pre Intervention Phase	Discourse Analysis of the videotape recordings	Mean number of messages per minute (frequency of interactions)
Intervention Phase		Mean number of messages per interchange (extent of interactions)
Post Intervention phase		Discourse Functions
Post Withdrawal phase		Communication Functions
		Modes of communication used
		Partners' responses to participant

5.3.1 Frequency and Extent of Interactions

Of foremost interest were the following questions:

i. Was there any change in how frequently the adolescent who used AAC interacted with his peers?

ii. Was there any change in the number of messages per interchange (extent) in the interactions of the adolescent who uses AAC with his peers?

An *interchange* is defined as a coherent segment of interaction as discussed in chapter 3 (3.4.4.) Interchanges were divided into *messages*, which could be an initiation, a response or a follow-on and (see 3.4.4) constituted the basic unit of analysis.

5.3.1.1 Frequency of interactions expressed as the mean number of messages per hour

The frequency of interactions was determined by dividing the total number of messages for each context by the number of hours for that particular context to obtain the mean. Means were determined throughout all phases of the research study with the exception of the withdrawal phase. Standard deviations were also calculated. A summary of the results reflecting the mean number of messages within each context is presented in Table 5.4.

Table 5.4 Mean Number of Messages per Hour

Phase of Research	Context 1 - Teacher Directed Time		Context 2 – OBE Small Group Discussions		Context 3 – Informal Time	
	Mean number of messages per hour	Standard Deviation	Mean number of messages per hour	Standard Deviation	Mean number of messages per hour	Standard Deviation
Pre Intervention	22	0.19	84	0.77	55	0.42
Intervention	25	0.29	172	1.22	174	1.09
Post Intervention	58	0.93	215	2.08	284	3.01
Post Withdrawal	105	1.45	301	2.56	307	2.32

Table 5.4 reflects an increased frequency of messages across all phases of research within all three contexts. The increase in the frequency of the messages between the adolescent who uses AAC and his peer(s) is graphically represented in Figure 5.2 where context 1 refers to teacher directed time, context 2 refers to OBE small group time and context 3 refers to informal times within the classroom.

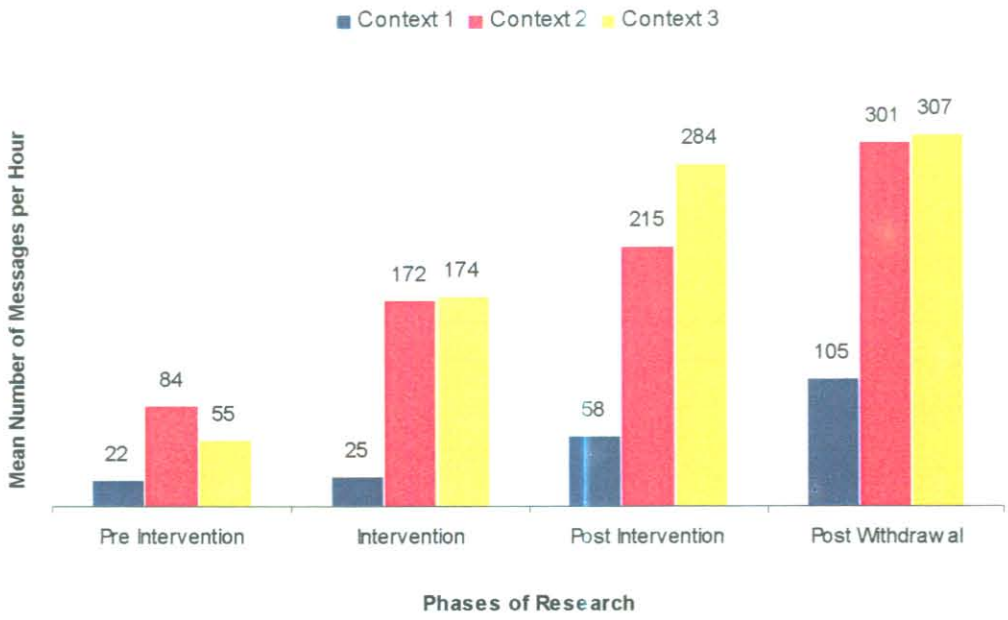

Figure 5.2 Mean number of messages per hour

The increase in messages was not uniform across contexts. Comparing the increase across contexts the following results were obtained:

i. The greatest increase was during context 3 (informal times) with a difference between pre intervention and post withdrawal phases of 252 messages per hour.

ii. The next largest increase was in context 2 (OBE small groups) where the difference between pre intervention and post withdrawal phases was 217 messages per hour.

iii. The smallest difference was during context 1(teacher directed time) which reflected an increase of 84 messages per hour from pre intervention to post withdrawal.

That the lowest number of messages per hour and smallest rate of change was evidenced in the context of teacher directed (context1) time is not unexpected. The principal increase in the informal time (context 3) context was significant as it is during this context that peers can choose with whom, to whom and for how long they wish to communicate and this would appear to indicate a definite increase in the social interactions of the adolescent who uses AAC with his peers as measured in messages per hour. It is interesting to note that the number of messages per hour is virtually the same at post

withdrawal during both the OBE small group time (context 2) and the informal (context 3) times. This is a positive finding as these contexts do offer different opportunities for interactions and the results could have been disparate. In OBE small groups (context 2) all the participants in a group were expected to offer opinions and to contribute to the group whereas in informal times (context 3) the adolescents were free to choose whether or not they wished to communicate with peers.

The increase in the number of messages per hour (frequency of interactions) with peers following peer training is consistent with the findings of other research studies during which peer training was implemented (Calculator, & Luchko, 1983; Carter, & Maxwell, 1998; Hunt et al., 1988; Hunt et al., 1992). The low number of messages per hour of the adolescent with peers at pre intervention is also consistent with findings that children who use AAC have few interactions with peers in school (Harris, 1982; Kraat, 1987; Light, 1988).

5.3.1.2 The mean number of messages per interchange (the extent of interchanges)

The mean number of messages per interchange between the adolescent who uses AAC and his peers was also of interest, the hypothesis being that should the peer training programme result in an improvement in the interactions between the adolescent who uses AAC and his peers this would be reflected not only in more messages per hour but also the interactions would increase in extent. The extent of interactions was not measured in time but rather as the mean number of messages per interchange. To determine the mean number of messages per interchange the total number of messages for each context within a research phase was calculated and then divided by the total number of communication interchanges for that context within that phase of research. This calculation was not applied to the withdrawal phase of research. The means and standard deviations of the number of messages per interchange are presented in Table 5.5.

Table 5.5 Mean Number of Messages per Interchange

Phase of Research	Context 1 - Teacher Directed Time		Context 2 - OBE small group discussions		Context 3 – Informal time	
	Mean number of messages per interchange	Standard Deviation	Mean number of messages per interchange	Standard Deviation	Mean number of messages per interchange	Standard Deviation
Pre Intervention	3.6	1.74	3.65	2.01	2.47	1.79
Intervention	3	1.87	5.56	5.56	5.38	4.36
Post Intervention	5.6	8.40	5.98	9.15	8.84	11.26
Post Withdrawal	6.56	6.29	10.2	8.46	7.53	4.97

These results are reflected graphically in Figure 5.3.

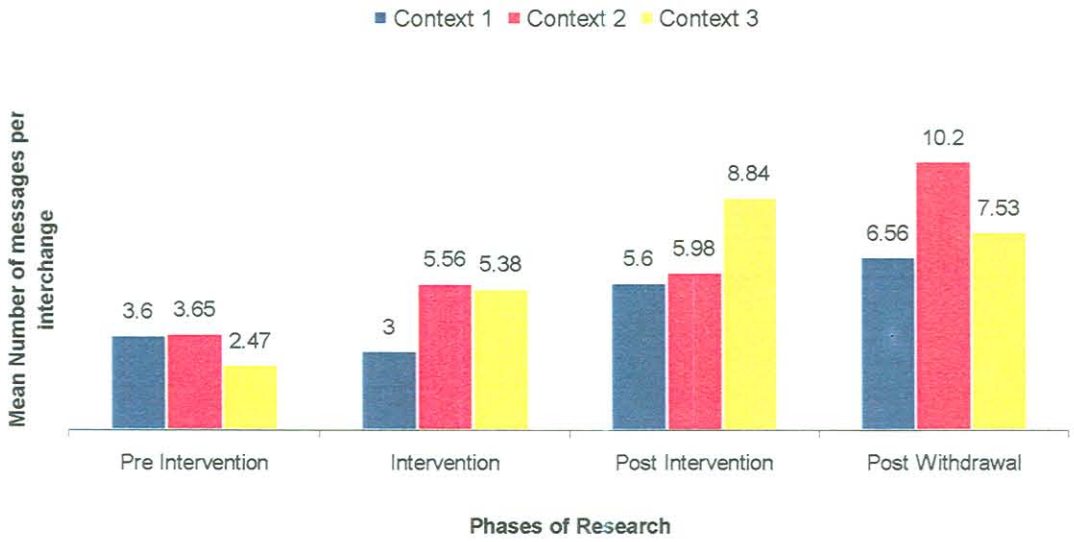

Figure 5.3 Mean number of messages per interchange

This graph does indicate an overall increase in the mean number of messages per interchange during each context from pre intervention measurements to those at post withdrawal. However, the mean number of messages per interchange during context 1 (teacher directed time) was less during the training phase than during the pre intervention phase falling from 3.6 to 3 messages per interchange. Similarly, the mean number of messages declined from 8.84 to 7.53 during context 3 (informal times) between the post intervention and post withdrawal phases of the research. Please note the standard

deviation for the post withdrawal phase, context 3, is high. However, this last result is of concern as it indicates that despite there being a higher number of messages per minute the number of messages per interchange was less in the post withdrawal as opposed to the post intervention phase. This could possibly be explained by the adolescent who uses AAC initiating more interactions with peers but that the peers did not sustain these interactions.

To investigate if this could account for this discrepancy the number of interchanges that were initiated by the adolescent who used AAC was compared to the number of interchanges initiated by a peer or peers. This comparison is reflected Table 5.6.

Table 5.6 Ratio of Initiation of Exchanges

Context	Pre Intervention		Intervention		Post Intervention		Post Withdrawal	
	User	Peer	User	Peer	User	Peer	User	Peer
Context 1	7	3	17	5	10	12	37	17
Context 2	31	21	34	49	19	33	15	15
Context 3	12	5	16	24	25	19	18	17

The above table clearly indicates that the proposition that the adolescent who uses AAC was initiating more interactions with peers but that peers did not sustain these interactions was not substantiated. However, initiations of exchanges was slightly less for both the adolescent who uses AAC and the peers during informal times (context 3) in the post withdrawal phase compared to during the post intervention phase. Although this is of concern the fact that the earlier imbalance between initiations of the adolescent who uses AAC and his peers during informal times (context 3) was remedied is positive. Initiations during post withdrawal were a virtually even ratio of 18/17 compared to the 12/5 ratio in the pre intervention phase. Of note is the actual increase in the initiations of the peers from 5 during the pre intervention phase to 24 during the intervention phase, 19 in the post intervention phase and 17 in the post withdrawal phase.

Increased interaction as evidenced in the preceding paragraphs is important, as interaction with peers is essential for adolescents to develop competent social and communicative skills (Cartledge, & Milburn, 1995; Light, 1988). Increased peer interaction was also necessary for the adolescent who uses AAC to develop the required socio linguistic abilities to develop his relationships and his position within the peer group (Bigelow, & La Gaipa, 1980; Romaine, 1884). Increased interaction was of major concern as the pre intervention observational data had shown low intensities of interaction by the primary participant, who had confirmed at the commencement of the study that several of his class peers had never interacted with him. Although this may have been due to the attitudes of his peers, the lack of interaction with his peers could result in the adolescent who uses AAC being considered to have insufficient interaction skills, which would exacerbate his being ignored or even result in rejection by peers (Whitmire, 2000). Previous research that showed that children who use AAC:

(i) Are seldom described as interacting with peers (Kraat, 1987)

(ii) Are dominated by the speaking partner and deprived of his/her turn in interactions (Light et al., 1985a)

(iii) Infrequently initiate topics or interactions (Light et al., 1985a)

(iv) Tend to be passive and merely respond with short answers to his/her speaking partners (Buzolich, & Lunger, 1995; Light, Collier, & Parnes, 1985b)

Considering the above, it was important that the interactions of the adolescent who uses AAC should increase (Light et al., 1992). For interactions to be rated as more successful this asymmetry needed to be lessened and the adolescent who uses AAC needed to take a more equitable part in interactions in order to achieve greater communicative competence and to meet the goal of social closeness (Light, 1989).

5.3.2 Qualitative Analysis of Observational Data

The videotaped exchanges were then further coded and analysed according to the following categories; (i) discourse functions, (ii) communication functions and (iii) communication modes employed by the adolescent who uses AAC as well as (iv) the responses of the peer partner or partners. The classification of each division within the categories was described in table 4.9 in the methodology. To evaluate the incidence of use of each of the four types of discourse function the number of times a function was used was converted into the number of occurrences per hour. This process was repeated for the nine communication functions that were coded, the six modes of communication used by the primary participant and as well as the six categories of partner response. This allowed for the incidence of each function or mode to be readily compared to the other functions or modes across the phases of research within each context. These results were prepared separately for each context and tabulated allowing for a comparison of the incidence of each function, mode or partner response in the different contexts. The analysis of the interactions between the adolescent who uses AAC and his peers during context 1, teacher directed time, across all phases of the research is presented in Table 5.7.

Table 5.7 Results of Analysis for Teacher Directed Time, Context 1

Category Description		Pre Intervention Phase	Intervention Phase	Post Intervention Phase	Post Withdrawal Phase
Discourse Functions of the Adolescent who uses AAC					
i	Initiation of interaction	5	7	5	13
ii	Re-initiation	3	1	0	4
iii	Response to peer	1	2	6	6
iv	Discourse Maintainer	5	6	31	42
Communication Functions of the Adolescent who uses AAC					
i	Social greeting/ norms	3	1	7	7
ii	Answers Yes/No question	0	1	3	8
iii	Answers contingent (open ended) question	0	0	0	1
iv	Requests or asks a questions	3	2	4	10
v	Offers information	1	3	4	5
vi	Voices opinion	2	2	18	9
vii	Expression of feelings/emotions	2	2	14	9
viii	Teases, pretends, humour or sarcasm	1	3	7	15
ix	Interrupts conversation of peer(s).	0	0	0	0
Modes of Communication of the Adolescent who uses AAC					
i	Voice: vocalisation or verbalization	8	11	37	54
ii	Facial expression	1	1	1	0
iii	Body movement	1	2	5	9
iv	DeltaTalker™	0	0	1	0
v	Eye gaze/eye pointing	1	0	1	0
vi	Computer	0	0	0	2
Partner Responses to the Adolescent who uses AAC					
i	Initiation by peer	2	2	6	6
ii	Partner responds appropriately	5	6	4	11
iii	Partner ignores adolescent who used AAC	1	1	1	4
iv	Discourse Maintainer	3	4	23	28
v	Partner clarifies message	0	1	0	2
vi	Partner does not understand user	1	2	1	6

This table clearly shows the following:

i. The greatest increase within the category of discourse functions was in the division of discourse maintainer supporting the result that the extent of the interchanges increased.

ii. At post withdrawal the primary participant initiated interactions more than twice as frequently as he did in the pre intervention phase.

iii. The primary participant answered far more yes/no questions at post withdrawal than during other phases of research

iv. The incidence of requesting/ asking questions and teasing/ pretending/ humour/ sarcasm showed considerable increases at the post withdrawal phase of the study.

v. The communication functions of voicing opinions as well as expressing emotions/feelings increased markedly at post intervention but decreased at post withdrawal. However, the incidence of these functions was still higher at post withdrawal than at the pre intervention or intervention phases of research.

vi. The primary participant did not interrupt his peers (communication function ix) at any time during this context, teacher directed time.

vii. The primary participant's use of his natural voice as his primary mode of communication is evident.

viii. The partners generally responded appropriately to the primary participant. The incidence of discourse maintainer increased markedly indicating that the increase in the number of messages per interchange was due to the contributions of messages by both the peers and the primary participant.

The analysis of the interactions between the adolescent who uses AAC and his peers during context 2, OBE small group discussion time, across all phases of the research in terms of the number of occurrences per hour is presented in Table 5.8.

Table 5.8 Results of Analysis for OBE Small Group Discussion Time, Context 2

Category Description		Pre Intervention Phase	Intervention Phase	Post Intervention Phase	Post Withdrawal Phase
Discourse Functions of the Adolescent who uses AAC					
i	Initiation of interaction	14	13	13	16
ii	Re-initiation	4	3	2	8
iii	Response to peer	9	17	22	13
iv	Discourse Maintainer	20	53	79	117
Communication Functions of the Adolescent who uses AAC					
i	Social greeting/ norms	2	5	3	12
ii	Answers Yes/No question	13	25	22	22
iii	Answers contingent (open ended) question	1	4	2	13
iv	Requests or asks a questions	3	8	13	24
v	Offers information	19	11	46	9
vi	Voices opinion	3	14	12	20
vii	Expression of feelings/emotions	2	8	14	18
viii	Teases, pretends, humour or sarcasm	4	12	5	36
ix	Interrupts conversation of peer(s).	0	0	0	0
Modes of Communication of the Adolescent who uses AAC					
i	Voice: Vocalisation or verbalization	23	59	94	135
ii	Facial expression	1	2	3	0
iii	Body movement	14	27	18	25
iv	DeltaTalker™	5	2	2	0
v	Eye gaze/eye pointing	4	0	1	0
vi	Computer	0	0	0	1
Partner Responses to the Adolescent who uses AAC					
i	Initiation by peer	10	19	23	16
ii	Partner responds appropriately	14	17	15	18
iii	Partner ignores Adolescent who used AAC	6	5	3	3
iv	Discourse Maintainer	13	45	57	118
v	Partner clarifies message	2	6	5	5
vi	Partner does not understand adolescent who used AAC	5	15	9	6

This table demonstrates:

i. A noticeable increase in the discourse function of discourse maintainer by the primary participant.

ii. Noticeable increases in the answering of contingent questions. Peers were made aware of the strategy and encouraged to ask the primary participant contingent questions during the peer training.

iii. Other communication functions to show noticeable increases included making requests/ asking questions, expressing of feelings/ emotions as well as teasing/ pretending/ humour/ sarcasm.

iv. The adolescent who uses AAC did not interrupt his peers at all during this context.

v. In this context the preferred use of his natural voice as his preferred mode of communication was most evident.

vi. The partner response in maintaining discourse showed the greatest increase in occurrence. A positive factor is the decrease in the occurrence of the partner ignoring the adolescent who uses AAC.

The analysis of the interactions between the adolescent who uses AAC and his peers during informal times, context 3, across all phases of the research is presented as the number of occurrences per hour in Table 5.9.

Table 5.9 Results of Analysis for Informal Times, Context 3

Code	Category Description	Pre Intervention Phase	Intervention Phase	Post Intervention Phase	Post Withdrawal Phase
Discourse Functions of Adolescent who uses AAC					
i	Initiation of interaction	14	14	18	22
ii	Re-initiation	8	6	9	7
iii	Response to peer	11	21	14	18
iv	Discourse Maintainer	11	52	111	111
Communication Functions of the Adolescent who uses AAC					
i	Social greeting/ norms	10	4	7	14
ii	Answers Yes/No question	2	21	13	25
iii	Answers contingent (open ended) question	0	6	1	6
iv	Requests or asks a questions	10	9	17	28
v	Offers information	1	9	42	7
vi	Voices opinion	6	15	41	13
vii	Expression of feelings/emotions	3	12	10	14
viii	Teases, pretends, humour or sarcasm	6	15	14	49
ix	Interrupts conversation of peer(s).	0	0	0	0
Modes of Communication of the Adolescent who uses AAC					
i	Vocalisation or verbalization	28	74	135	146
ii	Facial expression	0	1	1	0
iii	Body movement	11	19	16	13
iv	DeltaTalker™	0	0	0	0
v	Eye gaze/eye pointing	0	0	1	0
vi	Computer	0	0	0	0
Partner Responses to the Adolescent who uses AAC					
i	Initiation by peer	6	20	14	20
ii	Partner responds appropriately	8	14	15	17
iii	Partner ignores Adolescent who used AAC	18	10	12	7
iv	Discourse Maintainer	5	48	81	98
v	Partner clarifies message	0	1	9	2
vi	Partner does not understand Adolescent who used AAC	1	3	15	17

This table confirms similar findings to those of the previous contexts.

i. The function of discourse maintainer shows the most marked increase and is consistent at both post intervention and post withdrawal phases.

ii. The initiation of interactions also doubled when comparing the incidence at pre intervention with that at post withdrawal.

iii. Communication functions noted to increase markedly include the answering of yes/ no questions, requests/asking questions, expression of emotions/ feelings and teasing/ pretending/ humour/ sarcasm.

iv. Although reflecting a higher occurrence at post withdrawal than at pre intervention, offering information and voicing his opinion fluctuate markedly between the phases of research.

v. As for both of the other two contexts, at no time did the primary participant interrupt the conversations of his peer (communication function ix).

vi. Vocalisations and verbalizations are also reflected as the preferred mode of communication of the primary participant in this context.

vii. Partner responses of initiating interactions, responding appropriately and, especially maintaining discourse, indicate positive increases. Ignoring the primary participant shows a steady decrease in occurrence throughout the phases of research.

The previous three tables provided an overview of the results of the evaluative analysis of the observational data. The salient features of each of the different categories, discourse functions, communication functions, modes of communication and the responses of partners will now be briefly discussed.

5.3.2.1 Comparisons of discourse functions

Discourse functions were compared according to the following four options namely:

i. Initiation of interaction by adolescent who uses AAC.

ii. Re-initiation by adolescent who uses AAC.

iii. Response by adolescent who uses AAC to peer (mostly the first response to an initiation by a peer or peers).

iv. Discourse maintainer.

Overviews reflecting the incidence of each option across the pre intervention, intervention, post intervention and post withdrawal phases of the research for each context are presented as bar graphs (see Figures F1, F2 and F3 in Appendix F). Line graphs depicting the occurrences per hour of each discourse function within the three contexts across the phases of research are included (see Figures F4 – F7 in Appendix F).

The most noticeable increase was in the incidence of the discourse function 4, discourse maintainer, during all three contexts from pre intervention to post withdrawal phases as reflected graphically in Figure 5.4.

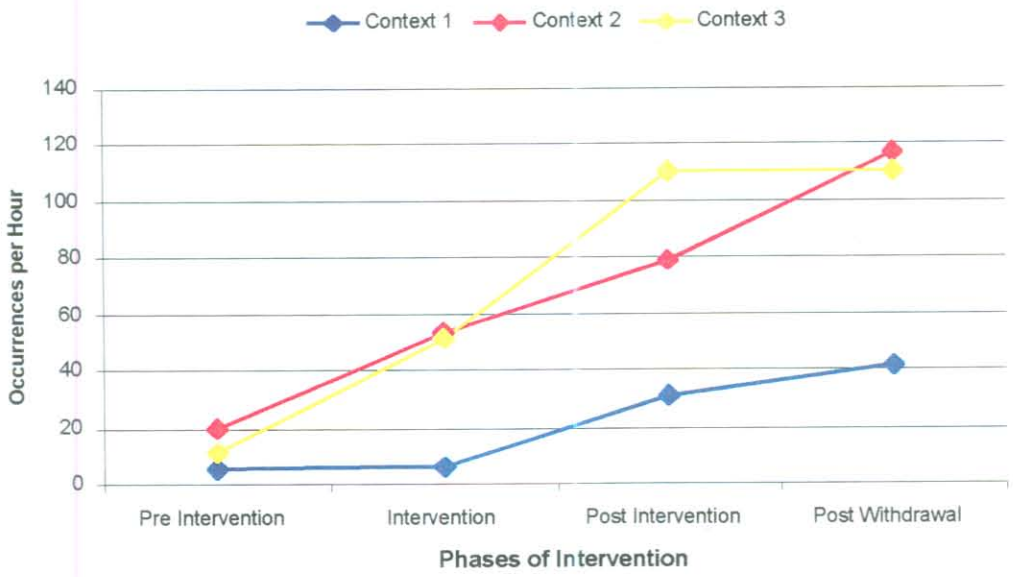

Figure 5.4 Comparison of incidence of discourse maintainer, discourse function 4, for the three contexts across the phases of research

This increase is noticeable across all phases of research in OBE groups (context 2). During teacher directed time (context 1), there was hardly any increase (5.2 to 5.7 occurrences per hour) between pre intervention and intervention phases but a marked increase was noted at post intervention (30.8 occurrences per hour) and at post withdrawal (a further increase to 41.5 occurrences per hour). During informal times, (context 3), there was a

striking increase from pre intervention to intervention to post intervention phases followed by a very slight decrease at post withdrawal. The increased levels of the use of discourse maintainer at post withdrawal when compared to pre intervention levels is a positive indication of increased interaction by the adolescent who uses AAC with his peers.

This finding correlates with the increase in "conversational turns" as a result of peer training in the study of Hunt et al. (1991). It was important that the interchanges of the adolescent who uses AAC be extended as the development of social and communicative competence both influences and is influenced by interactions with peer partners, (Butterfield et al., 1995). The ability to sustain interchanges and produce an extended sequence of contingent interactions is partly a developmental construct and early development is characterised by short sequences of interaction (McTear, 1985). However, the extent of a sequence will depend on external factors and in some cases shorter sequences can indicate a more mature interaction (McTear, 1985).

5.3.2.2 Comparisons of communication functions

Nine communication functions used by the adolescent who uses AAC were coded for comparison. They were:

i. Social greetings
ii. Answering yes/no questions
iii. Answering contingent or open ended questions
iv. Requesting or asking questions
v. Offering information
vi. Voicing opinion or giving instructions
vii. Expression of feelings or emotions
viii. Teasing, pretending, making humorous or sarcastic statements
ix. Interrupting conversation of peers.

A comparison of the occurrence of the communication functions coded is presented in bar graphs for each context (see Figures G1, G2 and G3 in Appendix G). Line graphs depicting the incidence of occurrence for each function during each context across the phases of research are also depicted (see Figures G4 –G12 in Appendix G).

During the training peers were encouraged to differentiate when it was appropriate to ask contingent questions as opposed to yes/no questions. Peers were encouraged to increase their use of contingent questions. However, use of the yes/no questions to increase the primary participant's rate of communication, establish immediate needs and wants, and to resolve misunderstandings was also encouraged. An increase in asking contingent questions was noted during the intervention and post withdrawal phases in the OBE small group context, context 2. Although this was a positive trend the incidence of answering "yes/no" questions remained higher than that of answering contingent questions.

Although there were generally increased occurrences of most of the communication functions monitored there was a noted fluctuation in the incidence of offering information, communication function 5. As this is an important pragmatic function for an adolescent involved in the OBE educational setting, the decrease from pre intervention to post withdrawal of this function within the OBE small group discussions is of concern and is reflected below in Figure 5.5.

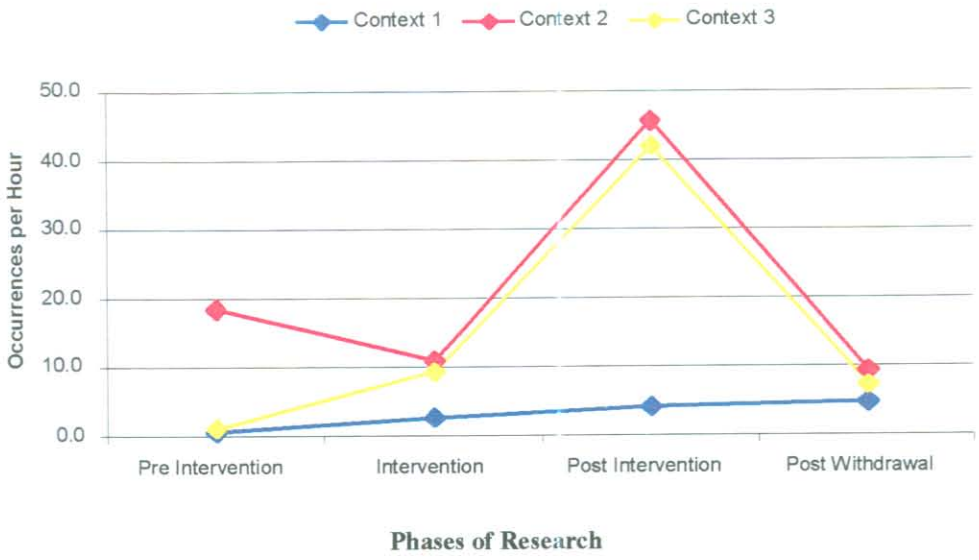

Figure 5.5 Comparison of the incidence of the communication function 5, offering information, across the phases of research

During the teacher directed context there is a slight but steady increase in the use of offering information by the primary participant. However, in both of the other contexts there is a wide fluctuation of the use of this communication function. It is also difficult to predict what the result would be due to the lack of consistency. The low incidence of the primary participant offering information during the OBE small group context, context 2, during the intervention and post withdrawal phases is of particular concern as it is in this context that learners would be expected to offer information or make suggestions. Possible contextual and partner related variables impacting on this function could be:

i. His world knowledge related to the specific topics discussed
ii. Different peers assigned to work together within the OBE groups.

It is during small group discussions involving set tasks that learners have greater opportunity to offer opinions/ information, initiate topics and to take part in *exploratory talk* (McTear, 1985). Exploratory talk reflects a collaborative interactive process in which the group shape and adjust their knowledge with experimentation of new ideas and implications (McTear, 1985). In these discussions adolescents usually surpass the contributions they would make in open class discussions and will e.g. provide an example, debate an assertion or qualify the contribution of a peer (McTear, 1985). According to

McTear (1985) the skills that adolescents have shown in small group discussions reflect more mature abilities akin to those of competent adults.

A zero level of occurrence throughout all phases of research in all three contexts for interrupting the conversation of peers (communication function 9) was recorded. In Western culture, the ability to interrupt is considered to be an important communication function and it is interesting that throughout the entire research project the adolescent who used AAC was not noted to achieve this successfully at all. Observation of the videotapes clearly demonstrated that the peers in the class frequently interrupted each other's conversations. The frequency of peers interrupting each other increases significantly from Grade 7 to Grade 12 (Nippold, 2000). At times interruptions are considered impolite but appropriate interruptions play a constructive role in promoting discussion amongst adolescents (Nippold, 2000). Being able to use the same interactive behaviours as peers, including interrupting, is an integral part of the socialisation process (Romaine, 1984).

The incidence of the primary participant asking questions or making requests increased markedly across all three settings from pre intervention to post withdrawal as indicated in Figure 5.6.

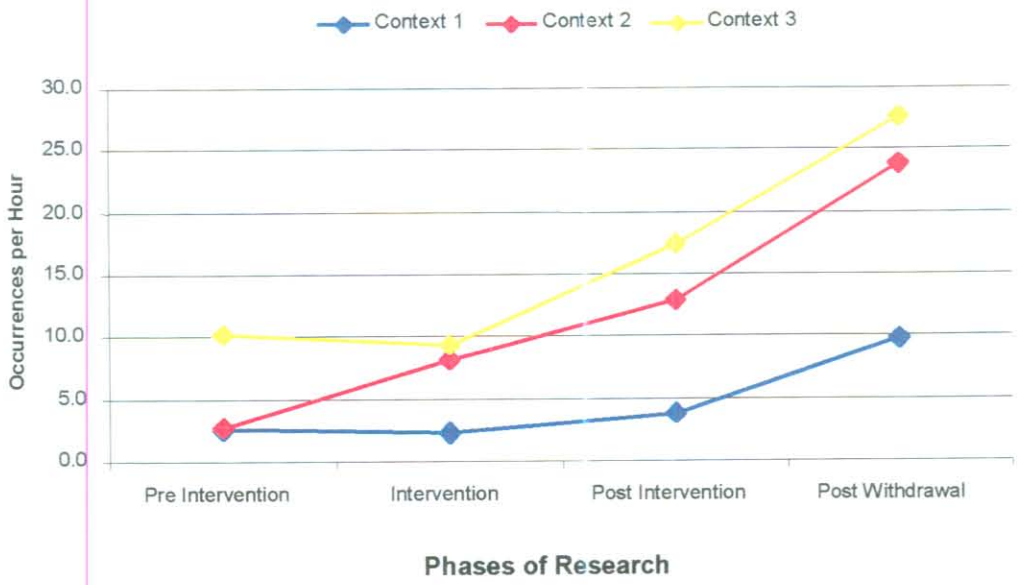

Figure 5.6 Comparison of incidence of communication function 4, asking questions/ making requests.

This marked increase and continued trend across the latter two phases of research is most positive as asking questions is an important communication function and a way to both initiate and sustain interaction with peers. Asking questions is a fairly complex linguistic function that is not easily learnt by young children who use AAC (Light et al., 1985b). In early adolescence the use and form of requests includes persuasion, asking for information and requesting opinions (McTear, 1985). Asking questions is thus an important conversational behaviour of adolescents that enhances interactions (Nippold, 2000). The adolescent in the study clearly had the required skills to ask questions but the increased use of this function within all three contexts may reflect improved self confidence or may have resulted from peer reinforcement of his attempts at communicating requests (Carter, & Maxwell, 1998).

A further positive result of the study was that the adolescent who uses AAC showed a marked increase between pre intervention and post withdrawal of communicating to express feelings and emotions as evidenced in Figure 5.7.

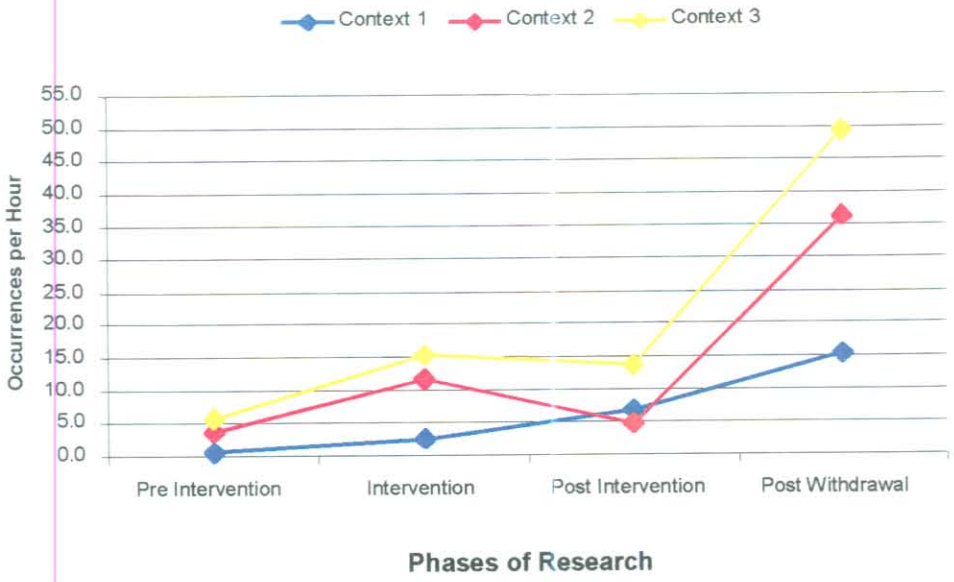

Figure 5.7 Comparison of incidence of communication function 7, expressing emotions or feelings.

The exceptionally low incidence of the primary participant's expressions of emotions was of concern when the pre-intervention phase data were examined. In viewing the videotapes of the pre intervention phase this was clearly in contrast to the behaviour of his peers in the classroom. The ability to express emotions including anger and frustration and to show feelings including affection for one another is an important communication skill for any adolescent (Nippold, 2000). These forms of social interaction are essential for the personal well being of adolescents (Nippold, 2000). The need to share feelings as well the ability to express emotions is important for an adolescent who uses AAC (Light, Beesley, & Collier, 1988). Increased interaction with peers has been previously discussed with regard to adolescence. The topics of interaction also differ with adolescents discussing personal issues and peer concerns with other adolescents (Nippold, 2000). Both male and female adolescents have also reported increased levels of affect when interacting with peers and the incidence of interacting by teasing and joking increases during adolescence (Nippold, 2000; Whitmire 2000). The incidence of the primary participant in teasing, pretending, joking, making humorous or sarcastic comments (communication

function 8) with his peers increased markedly when comparing occurrences during the pre intervention and post withdrawal phases of the research as evidenced in Figure 5.8.

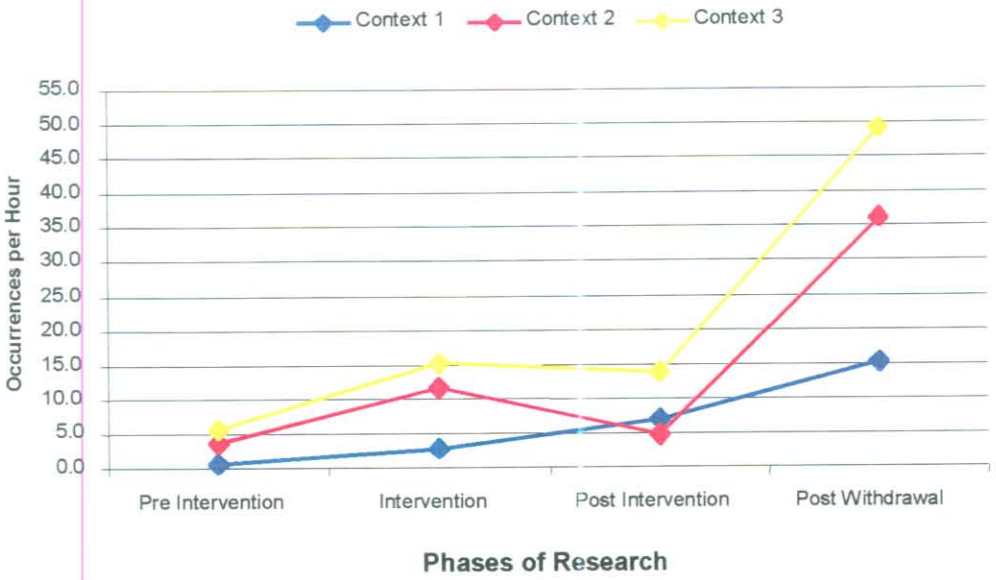

Figure 5.8 Comparison of incidence of teasing/ pretending/ humour/ sarcasm, communication function 8, across the phases of research.

The explicit increase in the primary participant's use of humour was positive as both his teachers and parents had mentioned his acute sense of humour as an important personality trait during the pre intervention interviews. It may also reflect an increase in his confidence in interacting freely with his peers. Self reports have indicated that adolescents are more spontaneous and relaxed when interacting with peers and often use humour to amuse peers (Nippold, 2000).

Both the appropriate expression of emotions and the use of humour are important pragmatic skills that are exhibited by competent communicators. Light (1988) tentatively suggests that the factors that determine the communicative competence of speakers may be the same that determine the communicative competence of persons who use AAC, but that the means and strategies of realising these same factors may differ. Using their sense of humour to put speaking partners at ease was one way that competent users of AAC demonstrated their level of social competence (Light, 1988). In addition in the process of

social closeness, one of the four main goals of communication as defined by Light (1988), it is essential that the adolescent who uses AAC should be able to freely express emotions.

5.3.2.3 Comparison of communication modes used by the primary participant

The primary participant used a variety of modes of communication. He often simultaneously employed more than one mode e.g. a verbalization accompanied by a facial expression or body movement. The modes that were coded included:

i. Natural voice i.e. Vocalisations and verbalizations
ii. Facial Expression
iii. Body Movement
iv. DeltaTalker™
v. Eye Gaze
vi. Computer

For the purposes of comparison only the primary or dominant mode of communication was coded. In certain instances two modes were used with equal intensity and both modes were coded. The incidence of occurrence per hour of each of the six modes of communication utilised by the primary participant as his primary mode of communication are presented in bar graphs (see Figures H1, H2 and H3 in Appendix H). Line graphs of each function within each context throughout the phases of research are also included (see Figures H4 – H9 in Appendix H).

The primary participant used his natural voice as his most preferred mode of communication. This was apparent throughout each context, teacher directed, working in small OBE discussion groups and informal time, and across all research phases. The increase in the incidence of him using his natural voice during interactions is reflected in Figure 5.9.

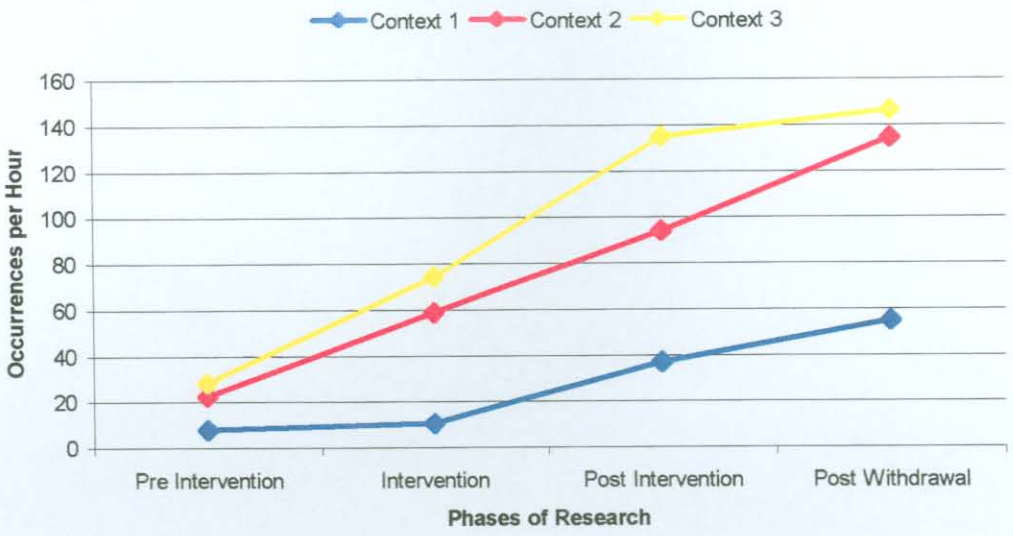

Figure 5.9 Comparison of incidence of using natural voice, mode 1, across the phases of research.

The second most important mode of communication used by the participant was mode 3, body movements. This was consistent in all three settings throughout all phases of the research project. The primary participant utilised the DeltaTalker ™, mode 4, to a very limited degree. The primary participant was consulted and agreed that the following were contributing factors:

i. Limited access - only one keyboard could be mounted on his laptray at any one time and as he needed frequent access to his computer for academic tasks the computer keyboard was most often in place.

ii. Lack of assistance to set up the DeltaTalker ™ on the mounting plate and to put on his headpointer if he was not wearing it.

iii. Self consciousness - he had recently become aware that using a VOCA made other people think that he was different.

iv. Slow rate and lack of intelligibility - he found it much quicker to use his natural voice and was also frustrated that his peers found the synthetic speech difficult to understand.

During adolescence peer pressure to conform to the manner, style and vocabulary of the peer group is a strong influence (Romaine 1984). The reluctance of the adolescent who uses AAC to use his VOCA may possibly have resulted in part from a desire not to be different as mentioned above. This view was supported by one of his parents. However, it must be remembered that using his voice was one of the easiest ways for him to communicate a message and this mode also conformed more closely to that of his peers.

5.3.2.4 Partner responses

A comparison of the occurrence of the six coded partner responses to the adolescent who uses AAC is presented for each context in bar graphs (see Figures I1, I2 and I3 in Appendix I). The peer interactions with the primary participant were coded according to the following six categories:

i. Initiation of interaction by the partner
ii. Partner responds appropriately to initiation of interaction by primary participant
iii. Partner ignores user
iv. Discourse maintainer
v. Partner clarifies message of the user e.g. by repeating it
vi. Partner does not understand user

In applying the codes it was evident that some of the messages of the partners met the definitions of two categories. When this occurred, the messages were given both codes, for example 4 and 6 in the situation when the partner did not understand the message and either asked him to repeat it or asked "what?" Line graphs depicting the incidence of occurrence for each of the coded partner responses were prepared (See Figures I4-I9 in Appendix I).

Partner response 4, discourse maintainer shows a marked increase in all contexts throughout the phases of research as indicated in Figure 5.10.

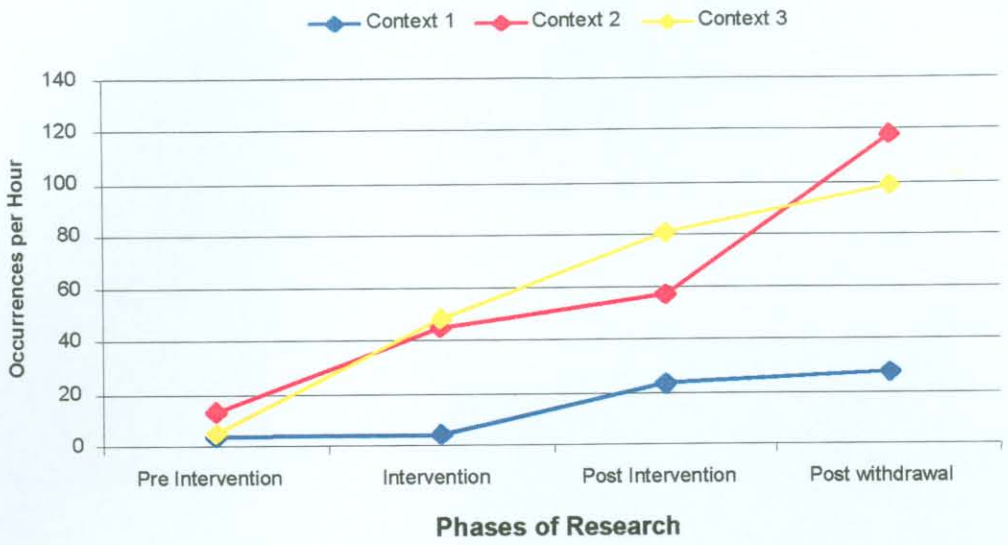

Figure 5.10 Comparison of incidence of partner response 4, discourse maintainer across phases of research.

This figure clearly shows the increased use of this response in all three contexts throughout the phases of research. This result confirms that the increase in the number of messages per interchange was due to the maintenance of the discourse by both the primary participant and the peers.

In their discussion of social relationships among adolescents with diverse abilities Meyer et al. (1998) discuss examples of what they refer to as the "invisible/ignore" code of behaviour in which peers ignore a classmate with severe disabilities. Research describing interactions of children who use AAC also describe a lack of response to the initiations of children with LNFS (Kraat, 1987; Light et al., 1992). This partner response was included in the category of partner responses for the pilot study and instances of the peers ignoring the adolescent who uses AAC were recorded at the pre intervention phase of the study. This response pattern of ignoring was coded as partner response 3 and the occurrence of ignoring by peers is reflected in Figure 5.11.

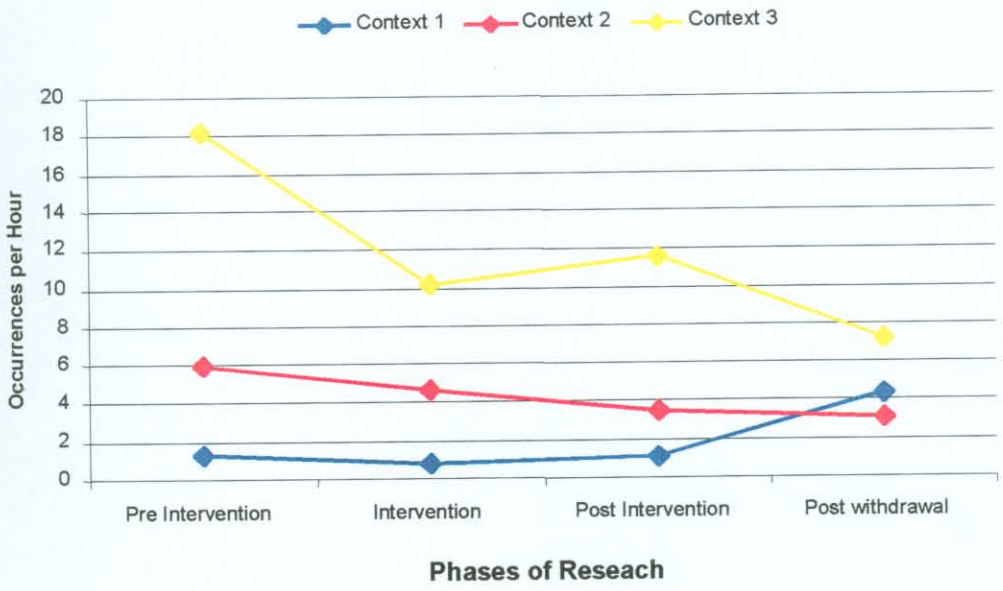

Figure 5.11 Comparison of incidence of partner response 3, partner ignores adolescent who uses AAC across phases of research.

A decline in the incidence of partners ignoring the adolescent who uses AAC is noted during contexts 2 and 3 (OBE groups and informal times respectively). This is considered a positive response to the peer training programme which encouraged peers to be more aware of the needs of the adolescent who uses AAC and included activities to enhance the peers awareness of how it felt to be ignored or misunderstood. The increase in the peers ignoring the adolescent who uses AAC during context 1 may well be appropriate to the context. In context 1, teacher directed time, learners were not expected to talk or interact. The increase in initiations and re-initiations of interactions by the adolescent during this context was clearly evident (see Figures E4 and E5 in Appendix E). The adolescent who uses AAC is not able to vocalize quietly and the peers would have needed to ignore him during this context in order to avoid being disciplined by the teachers.

5.3.3 Summary of Main Findings of Observational Data

There were noticeable increases in both the mean number of messages per hour and the mean number of messages per interchange indicating a greater amount of interaction

between the adolescent who uses AAC and his peers. This increase was confirmed by the increase of the discourse function of maintainer in all three contexts across all phases of research. This was evident both with respect to the adolescent who uses AAC and his peer partners. There were marked increases when comparing the pre intervention occurrences per hour with those of the post withdrawal with respect to the communication functions of asking questions/ making requests and the use of humour. The primary participant showed a noticeable preference to use his natural voice as his primary mode of communication with his peers. The peers showed an increase in initiations of interactions with the user and they also responded more appropriately to him as the research process progressed with a positive decline in the tendency to ignore the primary participant.

The analysis of the observational data was complemented by data obtained from additional measures that were used in the pre and post intervention phases of research. These measures included strategies for the self evaluation of the adolescent who uses AAC including his ability to communicate with his peers, strategies for evaluation by his peers, strategies for the evaluation of his social interaction with peers by the teachers as well as strategies for evaluation by his parents. The results of these additional measures are presented in the following section.

5.4 ANALYSIS OF DATA FROM THE PRE AND POST MEASURES

Four main categories of measures were used:

i. Self concept scales
ii. PACT Scales
iii. Socio-metric measures
iv. Interviews

An overview of the pre and post measures that were used and the parameters that were analysed by is presented in Table 5.10.

Table 5.10 Schematic Overview of the Data Analysis for Pre and Post Measures

Measuring Instruments	Parameters
Multidimensional Self Concept Scale	The self concept of the adolescent who uses AAC as reflected in social, competence, affect, academic, family, physical and total scales.
Self Description Questionnaire II	The self concept of the adolescent who uses AAC as reflected in physical abilities, physical appearance, opposite-sex relations, same-sex relations, parent relations honesty-trustworthiness, emotional stability, math, verbal, general school, general self and the total scales.
PACT Scales	Communication attitudes of the adolescent who uses AAC
▪ Adolescent who uses AAC	Partner communication attitudes
▪ Peers	Perception of partner attitudes by adolescent who uses AAC
▪ Teachers	Partners perceptions of the communication attitudes of the adolescent who uses AAC
▪ Parents	Communication attitudes of the adolescent who uses AAC
Peer nominations	Socio-metric status of the adolescent who uses AAC
Peer rankings	
Thematic & content analysis of interviews with the adolescent who used AAC	Perception of social interaction with peers of the adolescent who uses AAC
Thematic & content analysis of interviews with teachers	Teacher's perceptions of the social interaction of the Adolescent who uses AAC with his peers
Thematic & content analysis of interviews with parents	Parents' perceptions of the social interaction of the Adolescent who uses AAC

5.4.1 Multidimensional Self Concept Scale

This standardised self concept scale was discussed in the methodology (see 4.5.5.3). As the scale has both positive and negative items reverse scoring procedures apply in determining the raw scores achieved. Raw scores are converted to standard scores. Standard scores in the MSCS are based on an intelligence quotient metric with a mean of 100 and a standard deviation of 15 and were determined through percentile rank to standard score conversions (Bracken, 1992). Descriptive classifications of self concept for the range of standard scores are provided and the standard scores, percentile ranks and descriptive classifications are norm referenced. Norm referenced interpretation compares the performance of the individual with the performance of a sample of peers and it should be noted that the MSCS standardisation sample was USA based (Bracken, 1992). The MSCS has not been standardised with a South African sample. The MSCS also provides

for ipsative or intra-child interpretation that allows a comparison of the primary participant's performance on each individual scale with his overall performance, his average scale score. In this way areas of relative strength and weakness of self concept can be identified (Bracken, 1992).

The pre-intervention results of the MSCS are reflected in Table 5.11.

Table 5.11 Results of Adolescent who Uses AAC, Pre intervention, on the MSCS

	Norm-Referenced Interpretation			Ipsative Interpretation	
Scale	**Standard Score**	**Classification**	**%ile Rank**	**Difference Score**	**.05 Classification**
Social	73	Very negative	4	-10	Average
Competence	78	Moderate negative	7	-5	Average
Affect	80	Moderate negative	9	-3	Average
Academic	80	Moderate negative	9	-3	Average
Family	102	Average	56	+19	Strength
Physical	85	Moderate negative	16	+2	Average
Total Scale	80	Moderate negative	9		
Average Scale Score	83				

As can be seen from the above table the only result to fall within the average range was the "family" scale that was on the 56th percentile. The lowest standard score was on the social scale indicating a very negative self concept of his social abilities in relating to both boys and girls. Both the total scale score and the average scale score were more than 1 standard deviation (15 points) below the mean for the age of the primary participant, reflecting a rather poor (moderately negative) self concept. As expected on the intrachild evaluation the result on the family scale was a relative strength and the only other positive factor relating to his self concept was in terms of the physical scale. This is interesting in that the adolescent is regarded as having severe physical disabilities, has no independent mobility and is dependent for all activities of daily living. His weakest area of self concept relates to the social scale.

The above results can be compared to the post intevention results of the MSCS as reflected in Table 5.12.

Table 5.12 Results of Adolescent who Used AAC, Post Intervention, on the MSCS

	Norm-Referenced Interpretation			Ipsative Interpretation	
Scale	**Standard Score**	**Classification**	**%ile Rank**	**Difference Score**	**.05 Classification**
Social	77	Moderate negative	6	-16	Weakness
Competence	99	Average	48	+6	Average
Affect	92	Average	29	-1	Average
Academic	93	Average	33	0	Average
Family	99	Average	48	+6	Average
Physical	98	Average	44	+5	Average
Total Scale	92	Average	29		
Average Scale Score	93				

The higher scores obtained on the MSCS post intervention as opposed to those obtained pre intervention are evident in this table. The social scale, although improved, remains the lowest standard score obtained. Standard scores on the competence, affect and academic scales are all within one standard deviation of the mean as is the total scale score and the average scale score. For easier comparison of pre and post training scores they are presented graphically in Figure 5.12.

Figure 5.12 Comparison of pre and post training profiles of the adolescent who uses AAC on the MCSC.

The training programme would not have had any effect on the child's self concept related to family and it is interesting to note that this score remained virtually constant. However it is not possible to attribute the gain in self concept to the peer training programme as it is not possible to prove that the increased success of his peer interactions generalised to his self concept. According to the adolescent who uses AAC and his parents the peer training programme and the resultant increased success in his peer interactions were the only changes in his experiences and environment so may have been a contributing factor.

5.4.2 Self Description Questionnaire II

The SDQ II was the second standardised self concept scale to be completed by the primary participant and is discussed in section 4.5.5.4 of the methodology. Raw scores on the SDQ II were converted into percentile rank scores and *T* scores. Percentile rank scores indicate the percentage of children in the normative sample who scored at or below the self concept score of the primary participant (Marsh, 1990). *T* scores have a mean of 50 and a standard deviation of 10. The percentiles and *T* scores realised by the primary participant at pre intervention and post intervention are reflected in Table 5.13.

Table 5.13 Pre and post intervention results on the SDQ II

Scale Description	Percentiles		*T* Scores	
	Pre Intervention	Post Intervention	Pre intervention	Post Intervention
Math	30	44	44	49
Physical Appearance	28	64	45	55
General Self	11	41	37	50
Honesty – Trustworthiness	49	84	51	60
Physical Abilities	11	8	36	34
Verbal	39	36	47	46
Emotional Stability	14	16	39	40
Parent relations	31	49	47	52
General School	13	47	38	51
Same-sex Relations	4	3	31	30
Opposite-sex relations	6	5	32	30
Total Self Concept	8	24	36	43

Table 5.13 clearly indicates the improved scores post intervention as compared to those achieved on the SDQ II at the pre-intervention phase of research. Post intervention the total self concept score is within one standard deviation (10 points) of the mean. The largest improvements were noted on the general self and general school sub-scales. The lowest percentiles were on the same-sex relations and opposite-sex relations scales which correspond to the social scale on the MSCS. Pre and post intervention *T* scores are presented graphically to facilitate comparison in Figure 5.11.

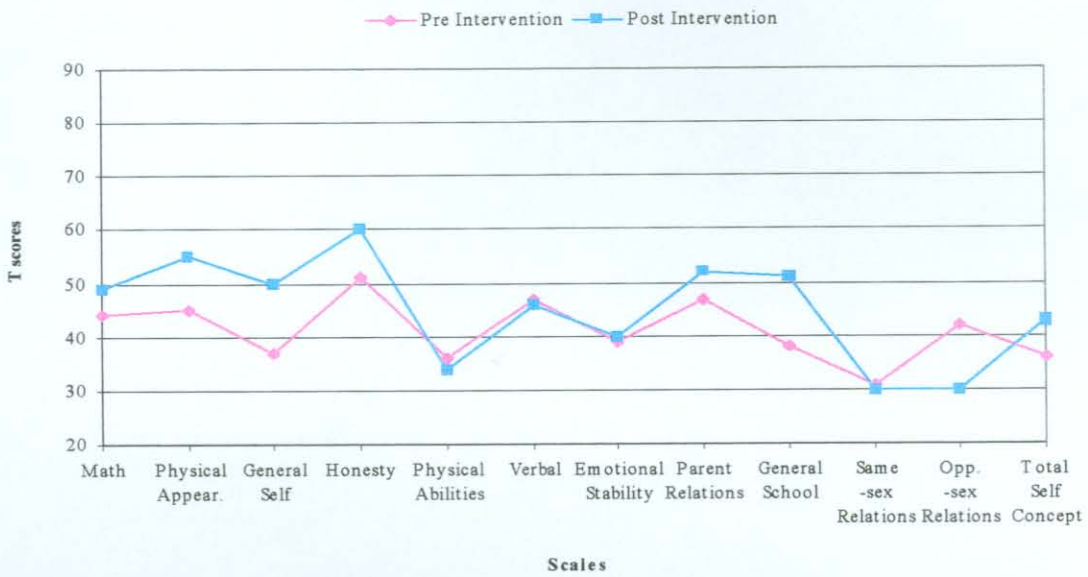

Figure 5.13 Comparison of pre and post training profiles of the adolescent who uses AAC on the SDQ II.

5.4.3 Discussion of Self Concept Scale Results

According to Bracken (1992) self concept is a learned behavioural response pattern and changes gradually as the person or his environment changes. Improvement in global self concept may result from differential success in one or more contexts and that success in one context may positively affect the person's self concept in other areas (Bracken, 1992). It may well be that the peer training programme was responsible for the improved self concept of the adolescent who uses AAC as reflected on the MSCS and SDQ 11 but this cannot be directly attributed to the programme.

In her discussion on the socio communicative considerations within AAC Warrick (1988) states that the modified community settings such as special schools include attitudes, philosophies and elements of the child/environment interface that influence the self concept of the learner who uses AAC either positively or negatively. Supporting the development of a positive self concept of the child using AAC relates to many aspects including characteristics of the AAC system and the development of relationships (Warrick 1988). Developing the child's communicative competency skills and supporting the development of positive relationships will enable the child or adolescent to experience positive self concept (Warrick 1988). Studies need to determine how communicative control influences self-concept as well as the influence of a person's positive self concept on communication skills (Warrick 1988). Natural speakers express their personalities and attempt to influence the perception of others by the style and content of their speech. And AAC interventionists should give meticulous attention to the social-communicative aspects of growth of children using AAC to enable them to project as positive a self concept as possible (Warrick 1988). The first factor listed by AAC clinicians as significant to identify a person using AAC as a competent communicator was a positive self image (Light 1988).

5.4.4 PACT Rating Scales

These rating scales assess communication attitudes (Culp, & Carlisle, 1988). The perceptions of the adolescent who uses AAC and partners can be identified as the scales were designed so that the same statements regarding attitudes could be presented to both the child and partner and or partners. This strategy allowed information to be documented within one or multiple dyads with respect to:

i. The child's (adolescent's) communication attitudes.
ii. The partners' communication attitudes.
iii. The child's (adolescent's) perception of partner communication attitudes
iv. The partners' perceptions of the child (adolescent) communication attitudes.

In evaluating the information from the PACT scales patterns of attitudes across a dyad may be identified as either consistent or inconsistent (Culp & Carlisle, 1988). An example

of a consistent pattern would be that both the person using AAC and the partner report positive (or negative) attitudes toward the communication of the person using AAC and their perceptions are consistent with the reported attitudes (Culp & Carlisle, 1988). Example of inconsistent patterns would be (a) if the person using AAC reported negative attitudes while the partner reported positive attitudes without perception of the negativity of the person using AAC or (b) the person using AAC reported positive attitudes and the partner reported negative attitudes but neither perceived the difference in attitudes toward the communication of the person using AAC (Culp & Carlisle, 1988). Each statement on the PACT scales are coded between 1-5 as follows:

1= Very wrong /Strongly disagree

2=A little wrong/Disagree

3=Not right or wrong/Neutral

4=A little right/Agree

5=Exactly right/Strongly agree (Culp & Carlisle, 1988).

5.4.4.1 PACT user rating scale

The attitudes of the adolescent who uses AAC with respect to his communication were explored by comparing his responses on the PACT user scale both pre and post intervention. The PACT scale allows for attitudes towards natural speech and an AAC mode to be evaluated.

5.4.4.1.1 Attitudes to use of speech and the VOCA

Both at pre and post intervention the primary participant strongly indicated that both when speaking and when using his DeltaTalker™ he felt he was able to express what he wanted to communicate. At pre and post intervention he indicated that he felt most people could not understand him when he spoke but that most people could understand him when he used his DeltaTalker™. At both pre and post intervention he also consistently indicated strong agreement with the statement that he liked to use his DeltaTalker™ but was unsure about whether he liked to speak. However, analysis of the observational data has revealed

that the primary participant made very limited use of the DeltaTalker™ and his preferred mode of communication with his peers was his natural voice, in contrast to his attitudes as reflected by the above responses on the PACT scale.

The full results of the PACT user scale were tabulated (see Appendix J). As expected his attitudes generally remained consistent from pre to post intervention apart from his responses to the following three statements:

i. I think I need to use my DeltaTalker ™ to do better in school
ii. My classmates understand how to use my DeltaTalker™
iii. My classmates like me to talk.

In the pre intervention scale he responded to the first statement with "strongly disagree" (1) and in the post intervention measure his attitude had changed to "strongly agree" (5). With respect to the second statement his perception altered from "strongly agree" (5) to "disagree" (2). His response to the third statement changed from "strongly disagree" (1) to "neutral" (3) from the pre to post intervention measures.

5.4.4.1.2 Discussion with respect to "I think I need to use my DeltaTalker ™ to do better in school"

In the classroom the adolescent who uses AAC experienced limited access to his DeltaTalker™ due to the fact that he could only access one keyboard at a time and his computer keyboard was most often mounted on his laptray. To access his DeltaTalker™ he needed to attract the attention of a peer and request that the computer keyboard be removed and the DeltaTalker™ be mounted in its place. In contrast the communication workshops were not held in the classroom and he attended these with his DeltaTalker™ ready mounted on his laptray. During the workshops he was expected to engage with all the peers in his grade at times including those who seldom and those who had never interacted with him. He had thus become aware of how the majority of the peers in his grade did not understand him when he spoke and of how often he needed to resort to using his DeltaTalker ™. Despite this realisation, there was little change in his use of the DeltaTalker ™ in class as accessibility remained poor.

5.4.4.1.3 Discussion with respect to "My classmates understand how to use my DeltaTalker™"

The peer training programme included procedures to increase awareness of the peers into the difficulties of using AAC strategies. These included some activities involving the use of the DeltaTalker™ and many of the peers had their first opportunity to 'operate' the DeltaTalker™. During these activities the adolescent who uses AAC became aware that most of his peers lacked understanding of how to use his DeltaTalker™. He had obviously been relatively unaware of this at the pre intervention phase and had assumed they knew how to operate the DeltaTalker™. The results of the PACT scales that were completed at pre intervention were not discussed with the primary participant until after the completion of the study.

5.4.4.1.4 Discussion with respect to "My classmates like me to talk"

The negative opinion of the adolescent who uses AAC in the pre intervention phase appears to relate to his feeling at that time that most of his peers generally did not wish to interact with him. As mentioned several of his class had never spoken to him. Although his response post intervention is neutral, this is a more positive response and may well reflect his general feeling of greater acceptance by his classmates as his interactions had increased during all contexts during class time.

5.4.4.2 PACT peer rating scale

The rating scale responses of each peer were compared to those of the user both prior to and following intervention. Thus the attitudes of the dyad of the adolescent who uses AAC and peer 1 were compared pre and post intervention, then the dyad of the AAC user and peer 2 etc. The pre and post intervention results for the user and peer PACT rating scales are presented in Table 5.14. The wording of the statements is shown as it appeared on the PACT peer rating scale.

Table 5.14 **PACT User and PACT Peer Partner Results**

Pre intervention **Post intervention**

No.	Topic	S.E		Peers																			
				1		2		3		4		5		6		7		8		9		10		11	
1	I enjoy chatting to S. E.	4	5	3	3	4	4	3	5	4	3	5	5	5	4	4	4	5	5	4	4	3	4	5	4
2	I really don't understand what S. E. tells me	3	3	2	3	4	3	2	4	3	4	4	3	4	3	3	3	3	3	3	3	3	3	4	5
3	S. E. can answer my questions	5	4	2	3	3	5	2	4	5	4	4	3	3	3	4	3	4	5	5	5	3	5	4	4
4	Most people understand S. E. very well	2	3	2	3	3	1	2	2	4	2	2	4	4	3	4	2	2	5	2	3	4	1	2	2
5	I don't understand S. E.'s jokes	2	2	4	3	4	2	4	5	5	2	4	5	4	3	4	3	2	5	1	3	3	1	4	4
6	S. E. likes to speak	3	3	3	3	5	5	3	5	3	3	4	4	3	4	4	4	5	5	5	4	4	4	4	4
7	I like S. E. to speak	1	3	3	3	5	5	3	5	3	1	3	5	4	4	5	3	5	4	3	5	4	4	4	4
8	Other people like S. E. to speak	4	3	3	3	4	3	3	3	3	3	4	3	4	4	5	3	5	3	5	4	3	4	2	2
9	S. E. likes to use his DeltaTalker	5	5	5	4	5	2	5	1	2	3	4	4	5	4	3	4	5	3	5	4	2	5	4	3
10	I like S. E. to use his DeltaTalker	3	3	4	4	5	3	4	2	3	5	2	3	5	5	5	4	5	3	5	3	5	5	4	4
11	Other people like S. E. to use his DeltaTalker	4	5	5	4	4	4	5	5	4	5	4	4	4	4	4	3	5	2	5	4	5	3		4
12	S. E. feels good about the way he speaks	3	3	3	3	1	1	3	1	2	3	4	3	4	3	3	2	1	2	3	3	2	3	4	4
13	I feel good about the way S. E. speaks	2	2	3	3	3	1	3	3	2	1	4	4	4	4	3	3	1	1	3	2	3	3	4	4
14	S. E. feels good about the way he uses the DeltaTalker	4	5	5	3	5	5	5	3	3	3	4	4	5	4	5	3	4	3	5	3	5	5	4	4
15	I feel good about the way S. E. uses his DeltaTalker	2	3	4	3	5	5	4	5	3	5	4	3	5	4	5	4	5	4	5	4	5	5	3	4
16	S. E. thinks it is important to use his DeltaTalker	5	5	4	4	3	5	4	3	3	3	4	4	4	3	4	4	4	3	5	3	5	3	5	4
17	I think it is important for S. E. to use his DeltaTalker	2	3	5	4	5	5	5	3	2	5	4	3	5	4	5	4	4	2	5	3	5	5	3	4
18	S. E. understands how to use his DeltaTalker	4	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	4	4
19	I understand how to use S. E. DeltaTalker	5	2	1	3	1	4	1	1	5	1	4	4	1	2	2	2	2	5	1	1	1	1	2	4
20	S. E. thinks he needs to use his DeltaTalker to do better in school	1	5	4	3	1	2	4	3	4	3	4	3	3	3	1	2	5	4	3	3	4	3	3	4
21	I think S. E. needs to use his DeltaTalker to do better in school	2	3	4	2	1	4	4	2	4	4	4	3	2	2	1	2	5	4	3	3	4	3	4	4
22	When speaking S. E. can say most things he wants to say	5	5	3	4	1	4	3	1	3	2	4	3	4	3	4	3	3	5	2	3	4	3	3	4
23	When using his DeltaTalker S. E. can say most things he wants to say	5	5	4	4	5	5	4	5	5	5	4	5	5	4	5	4	2	5	5	4	4	4	4	4
24	When S. E. speaks most people can understand him	2	2	2	3	1	2	2	2	5	5	2	2	3	3	1	3	2	4	2	3	3	3	3	2
25	When S. E. uses the DeltaTalker most people can understand him	4	4	5	5	4	5	5	3	5	5	4	5	4	4	4	4	5	5	5	4	5	4	4	4

As can be seen from the table 5.16 the responses of peers varied considerably from each other. However, all but one peer showed perceptions conflicting with those of the adolescent who uses AAC on the statement "I understand how to use S.E.'s DeltaTalker™" in the pre intervention phase. The peers had responded with "strongly disagree" (1) and "disagree" (2) to this statement whereas the adolescent who uses AAC had responded "strongly agree" (5) to the statement "My classmates understand how to use my DeltaTalker™". Post intervention the adolescent who uses AAC indicated that he disagreed (2) with the latter statement. This was in consensus with the perception of the majority of his peers although many rated their ability to understand how to use VOCA slightly more positively than prior to the training programme.

In comparing individual peer responses pre and post intervention several of the peers did not show marked changes in their attitudes. However, there was a noticeable trend to indicate that post intervention peers perceived that S.E. preferred to communicate using his own voice but they remained unsure (neutral) about the ability of most people to understand S.E. when he spoke. Four peers had changed their perceptions of the communication ability of S.E. substantially. They rated him more positively on most aspects. Examples of their changes in perception of 2 or more points are shown in table 5.15 below:

Table 5.15 Examples of Items Showing More Positive Ratings of the Adolescent who Uses AAC

PACT Statement	Pre	Post	Peer(s)
S.E. can answer my questions	3	5	2, 10
When speaking S.E. can say most things he wants to say	1 3	4 5	2 8
Most people understand S. E. very well	2 2	4 5	5 8
I like S.E. to speak	3	5	3, 9
I enjoy chatting to S.E.	3	5	3
When using his DeltaTalker™ S.E. can say most things he wants to say	2	5	8
S.E. likes to speak	3	5	3

5.4.4.3 PACT teacher rating scale

The results of the pre and post PACT teacher rating scale are reflected in table 5.16

Table 5.16 Pre and Post intervention results of the PACT teacher rating scale

No.	Topic	Pre Intervention		Post Intervention	
		S.E.	Teacher	S.E.	Teacher
1	His peers enjoy chatting to S. E.	4	4	5	3
2	His peers really don't understand what S. E. tells them	3	3	3	2
3	S. E. can answer his peers' questions	5	3	4	4
4	Most people understand S. E. very well	2	1	3	1
5	His peers don't understand S. E. 's jokes	2	4	2	2
6	S. E. likes to speak	3	4	3	4
7	I like S. E. to speak	1	5	3	5
8	His peers like S. E. to speak	4	2	3	2
9	S. E. likes to use his DeltaTalker	5	4	5	2
10	I like S. E. to use his DeltaTalker	3	5	3	5
11	His peers like S. E. to use his DeltaTalker	4	4	5	3
12	S. E. feels good about the way he speaks	3	3	3	2
13	I feel good about the way S. E. speaks	2	2	2	5
14	S. E. feels good about the way he uses the DeltaTalker	4	3	5	3
15	I feel good about the way S. E. uses his DeltaTalker	2	4	3	1
16	S. E. thinks it is important to use his DeltaTalker	5	3	5	4
17	I think it is important for S. E. to use his DeltaTalker	2	5	3	5
18	S. E. understands how to use his DeltaTalker	4	5	5	5
19	I understand how to use S. E. DeltaTalker	5	1	2	1
20	S. E. thinks he needs to use his DeltaTalker to do better in school	1	3	5	3
21	I think S. E. needs to use his DeltaTalker to do better in school	2	4	3	5
22	When speaking S. E. can say most things he wants to say	5	4	5	2
23	When using his DeltaTalker S. E. can say most things he wants to say	5	2	5	4
24	When S. E. speaks most people can understand him	2	1	2	1
25	When S. E. uses the DeltaTalker most people can understand him	4	4	4	4

The responses of the teacher were compared to those of the adolescent who uses AAC at both pre and post intervention phases, and the key results are reported including discrepancies between the attitudes and perception of the teacher compared to the adolescent who used AAC. Pertinent discrepancies are reported as well as changes in the perception of the teacher from pre to post intervention.

i. The adolescent who uses AAC felt he could definitely answer peers' questions (5) whereas the teacher was unsure of this and rated the statement "S.E. can answer his peers' questions" as neutral (3). However, post intervention both rated this statement as "agree" (4).
ii. S.E. agreed (4) that "other people like me to speak" whereas his teacher disagreed (2) with the statement "other people like S. E. to speak".
iii. In contrast to S.E. his teacher felt he needed to use his DeltaTalker™ to do better in school.
iv. At the pre-intervention phase his teacher disagreed (2) that S.E. was able to say most things with his VOCA. This was in contrast to S.E. who strongly agreed (5) that he could say most things with his DeltaTalker™. Post intervention his teacher agreed (4) with this statement.
v. Changes in the teacher's perception pre and post intervention included that the teacher felt far better about S.E.'s use of speech but was far less happy with his use of the VOCA for communication at the post intervention phase.
vi. The teacher had become aware of the fact that S.E. was reluctant to use his VOCA as this was discussed in the focus interview with her. Her increased awareness of this issue was reflected in her disagreeing with the statement that he liked to use his DeltaTalker™ at post intervention whereas at the pre intervention phase she was in agreement with this statement.

5.4.4.4 PACT parent rating scale

The responses of both parents at pre and post intervention phases are presented in Table 5.17.

Table 5.17 Pre and Post Intervention Results of the PACT Parent Rating Scales

Key: P1 = Parent 1 and P2 = Parent 2

No.	Topic	Pre Intervention			Post Intervention		
		S.E.	P1	P2	S.E.	P1	P2
1	His peers enjoy chatting to S. E.	4	4	3	5	4	4
2	His peers really don't understand what S. E. tells them	3	1	1	3	4	2
3	S. E. can answer his peers' questions	5	4	2	4	4	4
4	Most people understand S. E. very well	2	2	1	3	4	3
5	His peers don't understand S. E.'s jokes	2	2	4	2	4	2
6	S. E. likes to speak	3	4	4	3	4	4
7	I like S. E. to speak	1	4	5	3	4	4
8	His peers like S. E. to speak	4	3	2	3	4	3
9	S. E. likes to use his DeltaTalker	5	4	4	5	4	3
10	I like S. E. to use his DeltaTalker	3	4	5	3	5	5
11	His peers like S. E. to use his DeltaTalker	4	3	3	5	5	4
12	S. E. feels good about the way he speaks	3	2	2	3	2	2
13	I feel good about the way S. E. speaks	2	3	3	2	3	3
14	S. E. feels good about the way he uses the DeltaTalker	4	5	2	5	5	2
15	I feel good about the way S. E. uses his DeltaTalker	2	5	1	3	4	2
16	S. E. thinks it is important to use his DeltaTalker	5	4	4	5	4	2
17	I think it is important for S. E. to use his DeltaTalker	2	4	5	3	4	5
18	S. E. understands how to use his DeltaTalker	4	5	5	5	5	5
19	I understand how to use S. E. 's DeltaTalker	5	4	4	2	3	4
20	S. E. thinks he needs to use his DeltaTalker to do better in school	1	4	3	5	4	2
21	I think S. E. needs to use his DeltaTalker to do better in school	2	5	4	3	4	5
22	When speaking S. E. can say most things he wants to say	5	4	2	5	4	3
23	When using his DeltaTalker S. E. can say most things he wants to say	5	5	5	5	4	5
24	When S. E. speaks most people can understand him	2	2	2	2	2	2
25	When S. E. uses the DeltaTalker most people can understand him	4	5	5	4	5	5

Table 5.17 indicates that the attitudes of the parents were generally in agreement with those of S.E. apart from their attitude to his use of the DeltaTalker™ and their perception of how he felt about using the DeltaTalker™. An example is the statement "S.E. thinks he needs to use his DeltaTalker™ to do better at school". S.E. strongly disagreed with this

statement at pre intervention whereas both his parents perceived him to agree to this statement. One of the parents also felt that S.E. did not feel good about the way he used his DeltaTalker™ whereas the other parent's perception was in agreement with the positive attitude expressed by S.E. The pre and post intervention ratings by the parents were generally consistent apart from a more positive perception of how other people understand S.E. when he speaks.

Perceptions influence attitudes and attitudes in turn influence behaviour (Feldman,1993). The PACT scales provided important insights into the peers' perceptions and attitudes to the primary participant and his communication. However, people are often not fully conscious of their attitudes and attitudes are often more easily detected in behaviour (Aitken, 1996). Part of the peer training programme involved increasing the peers' awareness of the difficulties and nature of AAC. This increased awareness could have resulted in a change in their perception of the adolescent who uses AAC. In turn this could have contributed to the changes noted in their behaviour towards the adolescent who uses AAC. The programme also ensured that all the peers interacted with the adolescent who uses AAC and this could have had a positive influence as contact has to be interactive to be effective in changing attitudes (Armstrong et al., 1987).

5.4.5 Socio-metric Status

The peer nomination procedure was discussed in the methodology in section 4.5.5.6. Scores were reflected as the sum of the nominations received and are presented for the primary participant and his peers in table 5.18 below.

Table 5.18 Results of Socio-metric Nominations

		Peers												
Grade 8 Learners	**S.E.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Pre Intervention	30	15	16	19	19	16	40	12	19	28	11	2	19	17
Post Intervention	30	19	15	28	9	21	34	7	7	19	32	0	10	31

As can be seen from Table 5.18, at both pre and post intervention the primary participant received a total of 30 nominations. At pre intervention this was the second highest score and at post intervention the fourth highest score indicating that the primary participant was one of the more popular members of the class. Research into correlates of the socio metric status of children has shown that popular children are generally described as being skilled at peer relationships, are viewed as sociable and friendly by teachers and peers, are unlikely to be attention seeking, do not disrupt peer activities and demonstrate communicative competence (Rubin, Bukowski, & Parker, 1998). The results are interesting in that the primary participant, his teachers and parents were all concerned about his lack of peer relationships. However, he was described as friendly and as having a good sense of humour. During one of the communication workshops his peers had disclosed that they felt he was a reliable person who could be trusted with secrets. In addition he did not disrupt peer activities and was not attention seeking.

5.4.6 Interviews

As discussed in the methodology, 4.5.7.5, all the interviews were transcribed verbatim. The analysis of themes and conclusions about changes in pre and post interviews were cross-checked and verified with an inter-rater before being tabulated. A summary of the pertinent results is presented.

5.4.6.1 Analysis of interviews with the adolescent who uses AAC

In analyzing the potential impact of the peer training programme the comments of the primary participant at pre and post intervention interviews were compared according to themes related to the topic of his interaction with peers. The following aspects were noted to show definite change:

- Certain classmates had increased their interactions with him. This was most apparent with two of the male learners in his class.

- Two additional peers were considered to be friends. These were the two male learners referred to above.
- Interactions with his peers had improved and increased during OBE groups.
- More of his peers were willing to assist him. He cited four peers in this regard.

A detailed table of the analysis of the interviews with the primary participant is presented (see Appendix K).

5.4.6.2 Analysis of the interviews with teachers

The following variables as presented in Table 5.19 influenced both the provision of opportunities for peer interactions and the significance of the teacher's observations reported during the interviews.

Table 5.19 Variables influencing the provision of peer interactions during classes and teacher observations as reported in the interviews.

Variables affecting provision of opportunities for peer interaction	**Influence**
Teaching style	If the preferred teaching style was teacher directed teaching, fewer opportunities resulted. Conversely outcomes based educational practice in small groups encouraged peer interactions. "Batting" allowed for large periods of informal peer interaction.
Subject taught	More peer interactions were possible during certain subjects e.g. during Drama as opposed to English, both of which were taught by the same teacher.
Topic of lesson	Some topics allowed for increased peer interaction e.g. practical group experimental sessions allowed for more peer interaction than the review of test papers during Natural Sciences (NS).
Level of discipline	When a teacher was more strict the amount of peer interaction was reduced as well as the extent and loudness of interactions
Variables affecting the significance of teacher observations	**Influence**
Number of teaching hours per fortnight	A larger number of teaching hours of the class resulted in increased teacher confidence in reporting on the participant's peer interaction and changes thereto.
Familiarity with the participant	The NS replacement teacher had acted as the participant's facilitator and therefore had a wider range of interactions with him in different contexts. Teachers who taught the participant during the previous years were more familiar with him.

5.4.6.2.1 The validity of the results of the interviews

Validity refers to the degree to which inferences drawn from the interview data would be appropriate. Certain factors were determined as important to consider with respect to the validity of the observations made by the teachers and these factors are presented in table 5.20.

Table 5.20 Positive Factors and Limitations Influencing Validity of Teacher Observations

Teacher	Positive factors	Limiting factors
Teacher A	High number of contact hours with class: 13 periods (11 hours 55 minutes) per fortnight. Multiple subject contexts (English, Drama and Guidance). Interactive teaching style during drama classes.	English language classes by nature largely teacher directed Familiarity over time as she had only taught the class from beginning of 2001
Teacher B	Familiarity over time as Teacher B had been the class teacher for this group for the year 2000	Limited number of teaching hours: 4 periods (3 hours 40 minutes) per fortnight Only one subject context, Human and Social Sciences (HSS) Limited opportunities for peer interaction as "the class does not lend itself to this type of teaching for HSS".
Teacher C	High number of contact hours with class: 6 periods (5 hours 50 minutes) per fortnight with entire class and 6 periods (5 hours 50 minutes) with half of the class. Two subject contexts: Natural Science (NS) and Technology. Class interacting in small groups during most lessons Familiarity over time as she had taught the class during the previous two years in addition to 2001.	Not present for entire research project. Only pre-intervention interview possible.
Teacher D	High number of contact hours with class: 6 periods (5 hours 50 minutes) per fortnight with entire class and 6 periods (5 hours 50 minutes) with half of the class. Two subject contexts: Natural Science (NS) and Technology. Class interacting in small groups during many of the lessons Familiarity with the participant as she had been his facilitator and interacted with him in different contexts	Only post –intervention interview possible.

The potential impact of the peer training programme is reflected in the summarised findings of the teacher interviews in Table 5.22. (See Appendix L for a detailed table of the analysis of the interviews with the teachers).

Table 5.21 Summarised Findings of Teacher Interviews

Theme	Findings		Possible Impact
Primary participant's interaction in peer group	Teacher A	Definite improvement -- peers more responsive	Definite change noted
	Teacher B	No change noted – lacks spontaneity	Inconsistent across teachers
	Teachers C/D	Definite change – interacting more and with a greater number of peers in group	
Friendship	Teacher A	Definite improvement noted. Two peers became friends in addition to one former friend	Definite change noted by two teachers.
	Teacher B	No significant changes. Only one friend.	No change noted by teacher B.
	Teachers C/D	Limited change- 2 peers named by C as friends then 5 peers named by D but attributed in part to computer games on participant's computer	
Participation in class	Teacher A	Definite improvement - good participation and more interaction with the boys in the class	Limited change
	Teacher B	No change noted – participation poor	Inconsistent across teachers
	Teachers C/D	No change noted – participates actively	
Peers' understanding of participant	Teacher A	Definite improvement – peers listening more and taking time to understand participant	Limited change
	Teacher B	No change noted	Inconsistent across teachers
	Teacher C/D	Some improvement – mention of four peers who understand him better	
Peers response to participant's way of communicating	Teacher A	Limited improvement	Very limited change
	Teacher B	Slight change in use of VOCA during lessons	
	Teachers C/D	No change – but increased use of VOCA to aid peers' understanding noted	
Loneliness at recess	Teacher A	No change	No impact
	Teacher B	No change	
	Teachers C/D	Very limited change – some recess time spent with a girl peer	

From the above table it is clear that the teachers varied in their opinions as to the impact of the peer training programme. Teacher B did not feel that the programme had had any impact on the interactions of the adolescent who uses AAC with his peers. The only change noted by her was a slight increase in the use of his VOCA during lessons. Teacher A, however, had noted definite positive changes and was able to provide examples of

these including an incident she had videotaped of a group of peers taking time to understand the contribution of the primary participant during a practical drama examination. Teacher A described his peers as being more responsive and the primary participant as being more involved and interactive. Teacher A had also noted that two additional peers had recently befriended the primary participant. Teacher D had also noted some positive changes but all of the teachers agreed that there had been no or very limited improvement in the primary participant's interaction with peers at recess.

5.4.6.3 Analysis of the interviews with parents

Both parents were involved with their son and expressed concern on a range of issues during both the pre and post intervention interviews including his lack of peer friendships. The negative effect this was having on their son at that time was a major concern. Both parents expressed fears about the effect poor peer relationships would have on his social development and later adult relationships and were aware of his need to interact more with peers. (See Appendix M for a detailed table of the analysis of the interviews with the parents). The potential impact of the intervention as defined by the parents is summarised in Table 5.22.

Table 5.22 Summarised Findings of the Interviews with Parents

Theme	Findings		Possible Impact
Level of interactions with peers	Parent 1	Not aware of any change.	Limited impact.
	Parent 2	Limited improvement as participant has reflected peers interact more during OBE groups	No consensus between parents
Friends	Parent 1	Limited improvement – aware of two new friends. Had invited a friend to visit and emailed some peers from school	
	Parent 2	Limited improvement -- aware of more boys who have become friendly but no contact out of classroom.	Limited impact
Loneliness	Parent 1	No improvement	No impact
	Parent 2	No improvement	
Peers' understanding of his speech	Parent 1	No change noted – very few peers understand him	No impact
	Parent 2	No change noted – only a few peers understand him	

Both parents were aware of limited positive changes with respect to friends and one parent had noted that the primary participant had spoken of increased interaction during discussion in class groups. There was consensus by the parents that loneliness remained a problem for the primary participant and that he had little opportunity for socialisation with peers apart from at school.

5.4.7 Consensus of Interview Conclusions

The primary participant, teachers A and D and one parent had noted an increase in his interactions with his peers in the classroom. In relation to the formation of friendships, the primary participant, teachers A and D and both parents were aware of two of the male peers who appeared to have become friends of the primary participant in addition to one peer who had previously been regarded as a friend. The primary participant also mentioned two other peers who were more willing to assist him. Teachers A and D felt that there was some improvement in the way peers understood the primary participant. There was general consensus that no benefit had resulted outside of the classroom.

5.4 CORRELATION BETWEEN OBSERVATIONAL DATA AND PRE AND POST MEASURES

The results and potential results of both the observational data and the data arising from pre and post measures were examined for the presence of convergent and divergent findings that would either substantiate or contradict each other. In addition some data derived from different measures used at pre and post intervention was contradictory. The format for the evaluation of converging and diverging findings is depicted in Table 5.21.

Table 5.23 Evaluation of Relationships between Findings

Results with Respect to:	Measuring Instruments	Parameters
Relationship between observational data and data from pre and post measures	Evaluation of the related factors that suggest 1. General trends 2. Specific issues that corroborate or challenge suggested results	Convergent findings that substantiate
Relationship between data from different pre and post measures		Divergent findings that contradict

5.5.1 Convergent Findings

5.5.1.1 Increase in frequency of interactions (number of messages per hour)

The increase in frequency of interactions was clearly evidenced in the analysis of the observational data. An awareness of this increase was confirmed by the primary participant in the post intervention interview as well as in the post intervention interviews with teachers A and D and one parent.

5.5.1.2 Apparent change in affect

The evaluative analysis of the observational data clearly showed that the primary participant was expressing his feelings and emotions more fully and that there was an increase in his use of humour during the intervention, post intervention and post withdrawal phases of research. On the MSCS scale of affect there was an increase in standard scores from 80 at pre intervention to 92 at post intervention.

5.5.1.3 Primary participant's use of voice

Analysis of the data from the videotapes clearly shows that using his natural voice was the preferred mode of communication by the primary participant. The responses of peers to the PACT partner scale showed that post intervention many of the peers had changed their perception to stating that natural voice was the preferred mode of the user.

5.5.1.4 The primary participant's ability to answer peers' questions

The communicative function of answering both yes/no and open ended questions increased in frequency during the research process as indicated in the evaluation of the observational data. The perception of the teacher changed at post intervention changed to reflect this perception in her response on the PACT scale.

5.5.1.5 The attitude of the primary participant to using his DeltaTalker™

It was explicit from the observational data that the adolescent who uses AAC seldom used his VOCA. The change in awareness of this fact was reflected in the teacher's response on the PACT scale at post intervention when compared with pre intervention

5.5.1.6 Influence of family on self concept

The highest score on the family scale of the MSCS and second highest T score on the SDQ II were confirmed in the observations of teacher C that the positive self concept of the primary participant was largely determined by his relationships with his family members.

5.5.2 Divergent Findings

5.5.2.1 Use of Deltatalker™ to improve school performance

Response on the PACT user scale indicated that the primary participant felt he had to use his Deltatalker™ to do better in school. However, analysis of the observational data showed minimal use of this VOCA and no occurrences were noted of his using it at the post withdrawal phase during any of the contexts.

5.5.2.2 Social relationships with peers

The socio-metric rating of the peers in his class indicated that the primary participant was rated as one of the popular members of the class whereas on the social scale of the MSCS and the same-sex relations and opposite-sex relations on the SDQ 11 he rated himself very poorly. Evidence on the videotapes also indicated that most members of his class interacted well with him in the classroom context.

5.6 OVERVIEW OF RESULTS

The following results were obtained:

5.6.1 Reliability

Reliability was high for the coding of the observational data. Intra-rater reliability was 97.5% and inter rater reliability was above 90% for both raters 2 & 3. The inter-rater reliability of theme identification of the audiotapes was 100% as total consensus was reached.

5.6.2 Interaction Patterns of the Adolescent who Uses AAC with his Peers

Analysis of observational data at the pre-intervention phase of the study established that the adolescent who uses AAC interacted with his peers:

i. By exchanging on average 22 (*SD* = 0.19) messages per hour during teacher directed time, 84 (*SD* = 0.77) messages per hour during OBE small group time and 55 (*SD* = 0.42) messages per hour during informal times.

ii. In interchanges that consisted of a mean of 3.6 (*SD* = 1.7) messages during teacher directed time, 3.7 (*SD* = 2.01) messages during OBE small group times and 2.5 (*SD* = 0.1.79) messages during informal times.

iii. Primarily by initiating interchanges as opposed to responding to the initiations of peers irrespective of the context. He needed to reinitiate interactions more frequently during informal contexts than during teacher directed or OBE small group contexts. The incidence of him maintaining a discourse was most prevalent during OBE small group discussions.

iv. Mostly to achieve the communication functions of meeting social norms and asking questions.

v. Primarily by using his natural voice in preference to other modes of communication throughout contexts.

In addition, his peers were more likely to respond appropriately to him and to maintain discourse with him than to ignore him or clarify his message during the contexts of teacher directed time and OBE small group discussions. However, during the context of informal times he was most likely to be ignored.

5.6.3 Possible Effects of Peer Training on the Social Interactions of the Adolescent who Uses AAC

Analysis of the observational data at post intervention and post withdrawal indicated the possibility of the following effects of the peer training:

i. Substantial increases in the mean number of messages per hour during all contexts with the highest frequencies recorded at the post withdrawal phase of research.

ii. Considerable increases in the mean number of messages per interchange indicating that interactions were maintained to a greater extent than at pre intervention.

iii. The most significant increase in the discourse functions monitored was in discourse maintainer supporting the evidence of an increase in the extent of interchanges. This was evident in all three contexts.

iv. Within the context of teacher directed time the most obvious increases were related to the communication functions of requesting/asking questions and teasing/pretending/use of humour/sarcasm. During the OBE small group context the most obvious increases were to achieve the communication functions of answering contingent questions, requesting, expression of feelings/emotions and teasing. During informal times he showed the largest increases in the use of answering yes/no questions, requesting, as well as teasing and the expressions of feelings.

v. At no time during the study did the primary participant successfully interrupt the conversation of his peers.

vi. The use of his natural voice remained the most preferred mode of communication by the primary participant with body movements also increasing particularly in the context of OBE small group discussions.

vii. The most obvious increase in the nature of the peers' response to the primary participant was in discourse maintainer indicating that the increase in the mean number of messages per interchange was a reflection of increased messages from and directed to the primary participant. A second positive factor was the decrease in the occurrence of the peers responding by ignoring the adolescent who uses AAC.

5.6.4 Results of Self Concept Scales at Pre and Post Intervention Phases of Research

i. There was a marked improvement of an average of 10 scale points in his self concept as measured by the MSCS. However, this cannot be directly attributed to the training programme as other variables may have influenced his self concept.

ii. An improvement in his self concept during the research period was also reflected in his scores on the SDQ II.

5.6.5 Changes in the Self Evaluation of the Primary Participant

i. The attitudes and perceptions of the primary participant towards his communication generally remained consistent. However, post intervention he was more confident that his classmates liked him to talk.

ii. A marked change was apparent in his attitude to using his DeltaTalker™ to do better at school. He strongly disagreed that he needed to use his DeltaTalker™

to do better at school at pre intervention but strongly agreed with this statement at post intervention.

iii. He also became more aware that his peers did not know how to operate his DeltaTalker™ and he perceived his peers as being more willing to talk to and assist him at post intervention as opposed to pre intervention.

5.6.5.1 Results with respect to the attitudes, perceptions and behaviours of peers and the socio-metric status of the primary participant

i. Peer nomination procedures showed that the primary participant was one of the more popular members of the class and this did not change during the research period.

ii. Four of his peers changed their perception of the ability of the primary participant to communicate substantially, rating him far more positively on the PACT partner scale at post intervention than they had at pre intervention.

iii. Certain of the male class peers became far more friendly and interacted far more readily with the primary participant after the intervention. This fact was noted in interviews by the primary participant, two of his teachers and his parents.

iv. No change was noted in the social interaction of the primary participant out of the classroom context.

5.7 SUMMARY

In this chapter the results of the research were described and briefly discussed. Measures to ensure the reliability of the results were initially described. The results of the questions posed by the primary and sub aims were presented. Changes in the interaction of the adolescent who uses AAC with his peers within the classroom context were discussed. The extent of the recordings on which the observational data were based provided a sound basis and allowed the results to be presented with confidence.

Changes in the self concept of the primary participant that were potentially due to the peer training programme were described. As self concept is a relatively stable concept the changes noted in the performance of the primary participant on both of the self concept scales administered were unexpected. Findings of the other pre and post measures were briefly discussed as well as convergent and divergent findings. A summary of the pertinent results as they related to the sub-aims of the study concluded the chapter.