CHAPTER 12
Peer learning and participation in AAC intervention

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This chapter discusses the importance of peer learning and participation in augmentative and alternative communication (AAC) intervention, by describing the importance of social interaction and, in particular, the need for children who use AAC to be involved in peer interactions. Peer training in AAC research is discussed and a training programme for the facilitation of peer interaction is described. The programme describes pre- and post-measures and provides some data on the outcomes of the study. Challenges of peer training are discussed and research implications are highlighted.

The importance of collaborative learning within the educational context

Collaborative learning in schools has become widely practised in both developed and low-income countries and is inherent in educational policies involving outcome-based education. In collaborative learning, children work together in small groups towards a common goal, with individual children being accountable for their contribution - resulting in positive interdependence. The interactive tasks that form the basis of collaborative learning spontaneously stimulate the cognitive, linguistic and social development of the children. Diversity within the group has a positive influence as different interpretations result in a more active exchange of ideas during discussions.

The interest level of children involved in collaborative learning is higher, with improved academic performance and enhanced social functioning cited as outcomes. Effective collaborative learning fosters teamwork, problem-solving abilities, and critical-thinking skills such as analysis, formulating explanations, synthesizing and elaborating. Group processing activities as well as tasks to develop interpersonal and social skills such as constructive conflict-resolution are important aspects of collaborative teaching methods. Most importantly, the peer-support system that results from co-operative learning strategies helps children not only to accept and respect diversity among their peers, but also to understand and connect with one another. Children involved in collaborative learning give and receive emotional and academic support within the group, and develop valuable interpersonal skills. It has facilitated the acceptance and interdependence between children of different cultures, languages and ethnic groups as well as students with learning disabilities (Slavin, 1989). It is important to ensure that children with severe disabilities, including those who require AAC, also benefit from interdependent peer interaction within the classroom. This will contribute towards ending the social isolation and exclusion that are so frequently the experience of children who require AAC, particularly in low-income countries.

The primary goal of AAC is to enable children or adolescents with limited functional speech to communicate effectively in their daily interactions with others. The child or adolescent who uses AAC needs to successfully interact with both familiar and unfamiliar partners, including peers, in everyday situations within the natural contexts of home, school and the community. However, those who require AAC often have extremely limited social networks and many only communicate with immediate family or caregivers and with those who are paid to communicate with them. They often have no real interaction with peers despite the implementation of multimodal AAC systems and intensive training to promote communicative competence.

As AAC professionals and researchers, we have to make sure that children requiring AAC are involved in the natural, interactive contexts that are created by inclusion and collaborative learning practices, with resulting optimal learning opportunities for all children. There is a need to focus both on the skills to promote communication competence of the child using AAC as well as on equipping peers with the necessary skills to interact effectively with their peers who use AAC. Addressing the social participation of children who require AAC should be viewed as an integral component of AAC assessment and implementation processes (see Chapter 9: AAC technology for development).

Communicative competence for a person who uses AAC was defined by Light (1989) as consisting of linguistic, operational, social and strategic competence. However, the communicative competence of the child or adolescent who uses AAC is only part of the equation for successful interactions with peers. Calculator (1999) discusses five sets of variables that may influence interactions between a child who uses AAC and a peer partner:
1. Features of the AAC system or device.
2. The characteristics of the student who uses AAC, including abilities, personality, motivation, and attitudes.
3. The characteristics of communication partners, including their attitudes, perceptions, knowledge, style of interaction, and motivation to interact with students who use AAC. In addition, the character, experience, and the familiarity of the peer partners as well as the level of the support they have received are important.
4. The quality and content of the instruction given to both the student who uses AAC and the peer partners.
5. Additional associated variables such as opportunities and reasons to communicate.

Thus, it can be seen that achieving successful communication for children and adolescents who use AAC is a complex and demanding process that is directly determined by both the children who use AAC and their peer partners.

The need to involve communication partners is substantiated by the fact that both empirical research and clinical experience have proved that intervention directed solely at the person who uses AAC is not sufficient to ensure social competence (Light et al., 1992; McNaughton and Light, 1989). Sack and McLean (1997) have pointed out that professionals in the field of AAC must conceive an expanded role that includes training and supporting the daily communication partners of people who use AAC, in addition to teaching new interaction skills and communication strategies to the person who uses AAC (see Chapter 8: Support-based AAC intervention). This suggests that best practice in AAC intervention for children and adolescents needs to be twofold: (a) addressing the needs and building the competencies of the person using AAC and (b) instruction and training of significant communicative partners including parents, teachers, facilitators and peers. Although partner training is widely recommended in current AAC literature, there are few studies describing partner training and even fewer studies on child or adolescent peer-partner programmes. A barrier to implementing peer training is that peer-training programmes and models are not available, and thus the development of training programmes for the peers of children and adolescents who use AAC is essential.

Some of the difficulties experienced by children who require AAC in industrialized countries are documented and will be discussed later in this chapter. The difficulties experienced in low-income countries appear to be similar but, in addition, are exacerbated by limited or minimal early intervention services or access to therapy and education for children with severe disabilities. This is particularly true for children in rural areas. No governmental or medical insurance funding for AAC devices, and limited knowledge, skills, and expertise in AAC, are additional barriers. The large ratio of students to teachers in classrooms and inadequate support services further complicate the inclusion of children with disabilities into mainstream schools in low-income countries.

A child’s social development is inextricably linked to his or her development in areas of language, cognition, sensorimotor skills, play and personality. More advanced skills are based on earlier skills and experiences, and we need to consider the influence of early social development when evaluating the peer-interaction skills of the older child or adolescent.

The early social development of the child who is likely to require AAC - the risk of learned helplessness

The child with severe disabilities is frequently described as at risk for developing learned helplessness - a condition in which a child does not initiate interactions or readily respond to communication attempts by others. The child neither attempts to ask, nor does things, for him/herself. It describes a state of excessive passiveness that is basically caused by repeated experiences in which the child has not been able to have an effect on other people or the environment, i.e. he or she does not have an effect on what happens to him/herself. According to the learned helplessness theory, supplying rewards that are not dependent on the performance of an action can also lead to passivity (also see Chapter 3).

Children with severe physical, sensory or cognitive disabilities, who are by the nature of their disabilities dependent, are at risk for learned helplessness due to two reasons. First, because primary caregivers or family members are not able to interpret or respond to the child’s early communicative attempts, the child does not discern a relationship between his or her own actions and a response from people or the environment, eventually giving up. Parents and caregivers often do not respond contingently to early communication attempts by the child with disabilities, as these are often ambiguous or abnormal. Second, they are given free rewards, as adults seldom expect them to do or ask for anything, and so try to satisfy all of their needs regardless of any specific initiation or response from the children. A child with delayed social and communication development is at most risk for learned helplessness, because adults do not expect the child to indicate his or her needs and wants. In addition parents anticipate, and frequently misinterpret, the child’s needs. As a result, the child may relinquish any attempt to make his or her desires known, is extremely passive, and does not develop the necessary skills to
interact with peers (see Chapter 4, particularly the section on social exclusion).

In addition, concomitant motor, sensory and/or intellectual impairments may impede the young child’s ability to act effectively on people in the environment. Many young children who will require AAC do not have independent mobility or functional manipulation skills to independently access their environment – resulting in an impoverished experiential base for the development of language, communication and peer-interaction skills. The ability to use vocalizations to express likes and dislikes does not develop and opportunities for choice-making are frequently absent or far more limited than with the typically developing child. Parents and caregivers frequently underestimate the child with little or no functional speech (LNFS) and may assume responsibility for the child, significantly reducing expectations of the child.

The social interaction of the preschool child who requires AAC

Many children who have severe disabilities and require AAC lack opportunities to participate in dyadic interaction. The result is that they do not develop social contingency awareness and may not develop social signals, develop them far more slowly or develop unusual signals (Schweigert and Rowland, 1992). Social control and development by the child is further compromised, as the parent frequently does not recognize the signals, and without feedback from the child to the parent’s initiations the parent may become less responsive, resulting in the child having even fewer opportunities to interact and develop social contingency awareness (ibid.). Additional social development in gaining attention of other individuals, requesting an object, expressing needs, expressing an interest in another person or an object, expressing preferences, or making choices – may present difficulties for children with severe or multiple disabilities who require AAC.

There appear to be few studies involving peer interactions of preschool children who use AAC. In their studies of the communicative interaction between young children who used AAC and their primary caregivers, Light et al. (1985a, b, c) noted that:

- the interaction patterns of the caregivers with the children did not encourage the independence or communicative competence of the children;
- the children lacked attention-getting and initiation strategies;
- the range of communication functions used by the children was extremely limited, mainly being confirmations and denials.

The researchers also highlighted the difficulty young children experience in developing competence in using augmented modes to communicate when they are primarily exposed to spoken models (Light et al., 1985a, b, c).

Schweigert and Rowland (1992) have described an instructional sequence to teach social contingency awareness to children with dual sensory impairments and severe motoric disabilities. The children were aged from 10 months to 10 years, and when they began the study none of the children had any clear intentional communication. In many cases the use of microswitches was necessary to establish social contingency awareness, often resulting in the development of further communicative behaviours that were not reliant on switch use (Schweigert and Rowland, 1992). By the end of the study all the children had learned new communicative skills, from gaining attention to indicating choices (ibid.).

Janice Light (1997a), in her excellent article “Let’s go star fishing”: reflections on the contexts of language learning for children who use AAC, defined clearly the various interrelated contexts that make up the language-learning environment of the young child, and discussed the implications for the child using AAC. The contexts she described included the physical, functional, language, social and cultural, and within the discussion of the functional context, she highlighted findings that children with LNFS spent far more time in activities of daily living and routines, and that this severely restricted the time they spent in play and emergent literacy activities such as listening to stories. The importance of peer interactions in language learning was also discussed (Light, 1997a).

The value of collaborative interaction as the context for learning language in young children with severe physical disabilities and limited speech was suggested in a study by Letto et al. (1994).

The importance of social interaction for school-aged children and adolescents

Relationships with peers not only contribute to the social, cognitive, emotional and academic development of children, but also are extremely important in a child’s life, contributing to feelings of happiness and self-worth (Cartledge and Milburn, 1995). Generally the school-age years
result in a major change in the social context for most children. The size of the peer group is usually much larger and more diverse. Peer interactions also make up a far larger proportion of interactions than previously and are less closely supervised than during the preschool years (Rubin et al., 1998). The pattern of typical development clearly demonstrates that interactions with peers become increasingly important as the child matures, and are considered of utmost consequence during adolescence. Competent social interaction in adolescence is based on social and communicative skills that are learned in childhood through peer interaction (Romaine, 1984). Peer relationships in adolescence are more complex and differ in both quality and quantity from those of childhood (Meyer et al., 1998).

In early adolescence small groups of friends function as the primary base of interaction with peers and allow for regular interaction that is more spontaneous and relaxed than that with adults (Nippold, 2000; Whitmire, 2000). Early adolescent groups are generally composed of only one gender and these peer groups give adolescents the opportunity to develop social skills, share personal problems, support one another and develop mutual intimacy, allowing the adolescents to develop autonomy from parents (Nippold, 2000; Whitmire, 2000). As they develop, adolescents spend significantly greater amounts of time socializing with friends (Nippold, 2000; Rubin et al., 1998).

The goal of communication, which aims to develop interpersonal relationships, is particularly relevant to the adolescent phase, compared to the goals of expressing needs and wants, exchanging information and meeting social etiquette or norms. It is in meeting the goal of developing social closeness that people communicate to initiate, develop or sustain personal relationships and friendships (Light, 1988). The focus of the communication is on the interpersonal relationship – the content of the interaction is not significant (ibid.). Thus, in considering the relative importance of the four objectives of communication at different stages of life, communication to develop social closeness with peers is of increasing importance as the child matures and of supreme importance for adolescents (Light, 1997b). Social closeness is critical for adolescents, as it is during this life period that peer relationships and peer acceptance assume prominence and take priority over family relationships (Finc, 1980; see also Chapter 2, which describes the difference between sharing messages (participation) and involvement in the communication process).

The development of social-competency skills and mature social behaviours in typically developing adolescents is dependent on peer interactions and relationships (Bigelow and La Gaipa, 1980; Cartledge and Milburn, 1995). Both friendships and peer group acceptance are important influences on the development of social competence and on the self-esteem of the adolescent (Azmitia et al., 1998). The ability to be outgoing, to amuse peers, to participate actively in peer activities as well as the content and use of language all determine the social competence of typically developing adolescents (Cartledge and Milburn, 1995).

The social participation of children and adolescents who use AAC in school settings

Educational service delivery

Children with severe physical and/or intellectual disabilities are frequently not accommodated in either mainstream or segregated schools (schools for learners with special educational needs) in low-income countries. In South Africa students with disabilities have experienced great difficulty in gaining access to education. The Education White Paper 6 (2001) on special-needs education indicated that in 2001 an estimated minimum number of 280,000 learners with disabilities did not have access to either special or mainstream education. The report based this figure on World Health Organization (WHO) projections that between 2.2 per cent and 2.6 per cent of learners in any school system could be identified as disabled, and that only 64,200 learners with disabilities or learning impairments were enrolled in the 380 special schools in South Africa. The results of a lack of education and vocational training are self-evident but clearly, the impact in terms of limited social and community participation on the quality of life of these children is immense.

The movement towards inclusive educational systems whereby children with disabilities are accommodated within mainstream schools or ‘least restrictive environments’ has gained momentum in many low-income countries. Current educational policies in South Africa, as in many other low-income countries, are committed to a unified educational system of equal access that will ‘cater for the needs of all learners within an inclusive environment’ (White Paper on Integrated National Disability Strategy, 1997, p. 38). Yet few children with little or no functional speech (LNFS) are admitted to mainstream schools, and children who require AAC are frequently excluded admission to school for learners with special educational needs in South Africa. This problem is exacerbated in the rural areas where minimal intervention and schooling, special or otherwise, are available for children with multiple disabilities including those with LNFS. In these contexts AAC implementation plans may need to be structured to include not only the provision of suitable AAC systems, family and caregiver training but also peer training programmes with
community peers. A study conducted by the authors on the attitudes of typical students towards a peer who uses AAC, demonstrated that programmes focused on the training of peers are necessary to facilitate understanding between peers (Lilienfeld and Alant, 2002).

**Participation of students using AAC**

Despite a history of inclusive educational policies in industrialized countries, studies of children who use AAC seldom describe communication between individuals of equal status. Generally, the partners described were adults and were familiar to the child who used AAC. The social relationships of the dyad were thus usually asymmetric, with the partner being of a higher status (Light, 1988). Kraat (1987) also holds this contention and stated that, in most of the interactive research studies of children using aided systems, the children communicated in a dyad with a staff member or caregiver. In addition, the communication attempts of children with LNFS are frequently misunderstood or ignored by teachers and caregivers – with resultant communication breakdowns (Calculator and Dollaghan, 1982).

Children and adolescents who have disabilities and LNFS have been described as having limited opportunities to interact in peer groups and that this negatively influences the development of communicative and social abilities (Beukelman and Mirenda, 1992). Learning of communicative and social processes can only take place by regularly interacting with and by developing friendships with peers. Furthermore, to enable children and adolescents who use AAC to generalize communication skills, it is essential that opportunities exist with varied peer partners in natural settings. Thus communication and social-skills learning cannot be considered as goals in themselves but as interactive processes essential to social participation (Butterfield et al., 1995). Adolescents and young adults who use AAC have described feelings of isolation, barriers in getting to know peers, barriers to meeting and making friends, frustrations with respect to initiating and maintaining relationships with peers, and profound frustration with negative experiences related to attempts at peer acceptance and socialization (McCarthy et al., 2002).

With respect to the participation of students who use AAC in inclusive classrooms in America, Calculator (1999) observed two possible outcomes: (1) little or no evidence of social inclusion of some students using AAC, despite good operational competency skills, and (2) students using AAC who were active participants in academic and other activities and who interacted by initiating and responding to varied partners including peers (Calculator, 1999). It is clear that we need to facilitate the latter outcome in both developing and industrialized countries.

**The influence of partners in interactions involving AAC**

The importance of the communication partner or partners in influencing the success or failure of the interactions of persons who use AAC has been found to be decisive by many researchers (Bedrosian et al., 1992; Light, 1988). Some partners are instinctively far more competent in adapting to the distinctive requirement of interacting with a person who uses AAC, whereas other partners need to receive effective training in strategies to improve communication with persons who use AAC (McNaughton and Light, 1989; see also Chapter 9). There is an interactive effect between the competence of the peer partner and the competence of the person using AAC, each impacting on the other. The development of communicative competence is therefore inseparable from socialization and partner interaction (Butterfield et al., 1995; Whitmire, 2000).

**Peer training within AAC research**

One of the few resources for peer training with children who use AAC is PACT (Partners in Augmentative Communication Training) by Culp and Carlisle (1988). The programme was developed to facilitate the interaction of children who use AAC and their communication partners (ibid.). Communication partners addressed by the PACT programme include parents, teachers, siblings and peers (ibid.). Topics include priority communication behaviours, communication assessment guidelines, communication intervention guidelines, and psychological considerations, all of which include behaviours for both the child who uses AAC and the partner (Culp and Carlisle, 1988).

With respect to creating opportunities for communication for students with severe developmental disabilities, Sigafoos (1999) highlighted the importance of developing training programmes and support for peers. A communication opportunity was defined as a situation in which a partner would deliberately intervene and require an appropriate response from the child or adolescent who had a severe developmental delay and limited communication. Besides training teachers and staff, the crucial need to train and support other communicative partners who may be less familiar with AAC, such as peer partners, was noted by Sigafoos (1999).

Five typically developing adolescents acted as peer facilitators in a study by Hunt et al. (1988) to encourage the conversational interactions of three adolescent students with severe cognitive disabilities and limited speech. The students, two 16-year-olds and a 14-year-old, attended the same high school as the peers but were accommodated in a separate class. The training took place in a variety of the high-school campus and community settings with peers, five regular high-school students who worked as peer tutors and a university student doing a practical session.
(Hunt et al., 1988). Communication books of pictures were developed for each student as a means of promoting conversation and the peers supplemented their verbal comments by pointing to the pictures in the conversation books. The results of this programme of training included a decrease in inappropriate social behaviours and improved conversational skills of initiation and turn-taking. Subjective data from the peer tutors, parents and teachers indicated generalization of gains to other settings (Hunt et al., 1988).

In a later study, the same authors trained regular-education peer students as peer tutors to facilitate the conversational exchanges of three children, two of whom were ten years old and the other six years old (Hunt et al., 1991). The training included strategies to promote generalization of specific conversational skills. Brief instruction was given to the peer partners, who were regular education students at the same school and had volunteered to take part in the study (Hunt et al., 1991). The training of the peer partners took less than five minutes and was done singly or in pairs; it consisted of a demonstration with oral instructions on how to use the conversation book, and a short role-play with the instructor (Hunt et al., 1991). The researchers concluded that peer training appeared to be an essential component of the conversational training programme for the students with severe disabilities.

An interesting approach, adopted by Buzolich and Lunger (1995), was to train a 12-year-old girl, who used AAC, to train her partners. The intervention programme primarily focused on training the AAC-using girl to identify the interaction styles of three peer partners and to adopt strategies to gain greater conversational control, including topic direction, speaking-turn control and communication-breakdown management (ibid.). Following awareness and role-playing phases of training, five different peers took part in 30-minute conversations with the girl who used AAC, who was cued during the conversations by the AAC interventionist without influencing the peer partner (ibid.). Another approach proposed by Van Tatenhove (1992) was to use persons who were competent in their use of AAC as peer tutors and mentors.

Thus, although widely advocated, training of peer partners of children and adolescents has received limited attention. One study that focused exclusively on training peer-partner skills to increase the interaction of four children (three five-year-old boys and a girl of nine years of age) was conducted by Carter and Maxwell (1998). The intervention programme did not address the communication skills of the children who used AAC. During their baseline observations the peers seldom waited for a response from the child using AAC and frequently ignored the communication initiations of the child using AAC (ibid.). The training consisted of an orientation session during which the reasons for the study were explained and questions of the peers relating to both the disability (cerebral palsy) and the AAC systems of the participants were addressed (Carter and Maxwell, 1998). In addition, two peer instruction sessions were held lasting between 15 and 30 minutes per session. During the first session the peers were informed of the difficulties in communication without the use of speech, and the communication boards of the appropriate participants were discussed. The peers then role-played an interaction in pairs using the communication board (Carter and Maxwell, 1998). During the second lesson peers were taught four specific interaction strategies to apply with the AAC-users: making eye contact, asking questions, giving time for a response, and responding to initiations (ibid.). The researchers reported that the frequency of social interactions of the children who used AAC increased during intervention and also that there was an increase in the use of the taught intervention strategies by the peers (ibid.). Given that there was no training offered to the children who used AAC the researchers suggested that the increase in the communication interactions of the children who used AAC may have been due to one or more of the following reasons:

1. increase in the number of opportunities for interaction;
2. imitation of the peers who demonstrated the interaction strategies they had been taught;
3. as a process of natural peer reinforcement that occurred when the children using AAC attempted to communicate (Carter and Maxwell, 1998).

No further training was instituted but intervention effects were noted for between six and ten weeks for participants. Implementation of peer intervention programmes was suggested as a worthwhile method of increasing the social interactions of children who use AAC (Carter and Maxwell, 1998).

Butterfield et al. (1995) emphasize three aspects related to partner skills: (1) attitudes, (2) knowledge/information and (3) increasing opportunities to communicate. These three aspects are interrelated, as providing information and knowledge about the peer who requires AAC has a positive effect on attitudes towards the individual (Gorenflo and Gorenflo, 1991). Providing information and knowledge of how peers can improve their ability to communicate with a peer who requires AAC will generate increased opportunities for interactions (Butterfield et al., 1995).

Additional characteristics of conversational partners mentioned by Calculator (1999) that could be addressed in peer training include familiarity with the AAC system, motivation to communicate with the peer who uses AAC, and the nature of the messages including the verbal input of the partners. It would appear essential to address all of these issues in the peer training component of AAC intervention with children or adolescents who use AAC and to increase the peers' awareness of the value of their own skills as communication partners. In developing training
programmes for adolescents who use AAC it is imperative to identify the requirements of training and to ensure the training as well as the training procedures have a sound theoretical basis. A peer training programme, including the involvement of an adolescent who uses AAC, was conducted by the first author as part of her doctoral study (Lilienfeld, 2003) and relevant issues to this topic are briefly described.

Discussion of a peer programme aimed at training the peer group, including the adolescent who uses AAC, in communicative skills

The adolescent

The adolescent who uses AAC, Simon, was 15 years 2 months old at the onset of the peer training programme. He had severe athetoid cerebral palsy and was the only student in the class who required AAC. He steered his power wheelchair independently by operating a joystick with his left hand but utilized a head pointer to directly select the keys on both his computer keyboard and DeltaTalker.

Simon was a multi-modal communicator whose preferred method of communication was his natural speech, despite the fact that his speech lacked intelligibility. He was operationally competent in using a DeltaTalker with Unity 128 software.

He had mastered a core vocabulary of approximately 2000 words and short phrases using Unity 128. This software encodes words and common phrases by using sequences of pictures (icons). He understood the rationale of how the vocabulary was organized and was able to customize the software by storing specific vocabulary according to his individual needs. His rate of communication was slow, as he made frequent errors in accessing the keys with his head pointer. If he had forgotten a specific sequence of icons for a word or phrase he readily changed to the alternate spell mode and spelt out the required words, letter by letter.

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

The peer group

Simon and his peers attended a school for students with physical disabilities. At the school there was only one Grade 8 class, consisting of 14 students including Simon. There were eight boys and six girls in the class and the mean age of the class was 14 years. The medium of instruction at the school was English. Five of the children were from Zulu-speaking families, two were from homes where both English and Afrikaans were spoken, and the remaining seven were from homes where English was the first language. Twelve members of the class were ambulatory and two learners, including Simon, used power wheelchairs.

The training programme

1. The aims of the training programme

The goals of the peer training were determined by the difficulties Simon identified in his interactions with his peer group. The identified difficulties were matched with the desired interaction behaviours of peers, as in the examples presented in Table 12.1.

<table>
<thead>
<tr>
<th>Difficulties identified by the adolescent who uses AAC</th>
<th>Desirable interaction behaviours of peers</th>
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<tr>
<td>i. Inadequate time was given to him to formulate what he wanted to say during small group discussions, especially when using the DeltaTalker</td>
<td>Peers to be more aware of the time taken to interact using AAC strategies and to allow time for the adolescent who uses AAC to formulate messages, especially when using the DeltaTalker</td>
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<tr>
<td>ii. Insufficient opportunities to initiate interactions about topics of concern</td>
<td>Increasing awareness of their behaviours that block conversations with the adolescent who uses AAC</td>
</tr>
<tr>
<td>iii. Peers often addressed the adolescent who uses AAC and asked him a question but left before he could answer their questions</td>
<td>Improved listening and negotiation skills</td>
</tr>
<tr>
<td>iv. Peers pretended to understand his message when they had not done so</td>
<td>Peers to learn the strategy of waiting for a response from the adolescent who uses AAC</td>
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</table>

Increase peers' awareness of how frustrating it is for a person not to be understood. Peers to learn importance of telling the adolescent who uses AAC that they have not understood him and to learn methods to assist in clarification of his messages.
2. The communication workshops

The peer training programme consisted of eight workshops of 50 minutes' duration. The objectives were grouped according to specific goals and themes so that each workshop formed a cohesive unit. The units included:

- conversation (turnabouts);
- behaviours that block communication;
- listening skills;
- conversation maintenance;
- group consensus;
- feedback and clarification;
- rate enhancement and negotiation.

The final workshop included activities to recall and review aspects of the previous seven workshops.

Using games is an effective tool to increase rapport with adolescents and to improve their effort in learning social skills. For this reason games were used frequently during the workshops to reach specific objectives, e.g. 'the common pool', a game devised by Malouff and Schutte (1998) to increase peer co-operation, and 'What is my future?', a panel discussion game used to teach peers the rate-enhancement strategy of asking yes/no questions in appropriate settings.

Social modelling is the principle involved in the practice of teaching a behaviour by presenting a model to be observed and imitated. Excerpts of the videotape 'Face to Face: Facilitating adolescent communication experiences' (Hess, 1993) were used to model the use of contingent questions and comments. Adolescents also learn and maintain behaviour better when cognitive understanding is engendered. Throughout the training sessions there were group discussions to facilitate meta-communicative skills and to encourage the peers to attach relevance to specific skills. This seemed to increase the participants' motivation. Circle seating with the technique of 'rounds' being used during group discussion times promoted cohesiveness and facilitated interactions.

Behaviour rehearsal is considered crucial to ensure that social skills are learned effectively (Cartledge and Milburn, 1995). Activities were structured to enable the peers to practise skills. After introducing conversational turns (turnabouts), for example, a game using topic cards was played that facilitated the peers' interaction with Simon.

All the materials, including fun worksheets, topic cards, unfinished sentence cards, emotion cards etc., were carefully designed, multi-coloured, attractive and suitable for use by all the peers, including those with visual impairments.

3. Development of pre- and post-measures

Communication is a dynamic, complex process. The interactive behaviours of the individuals concerned constantly affect the understanding and behaviours of the other individuals involved in a process that is primarily managed by the codes of social interaction. Interactions involving a person using AAC are inherently multifaceted by virtue of the multimodal nature of AAC and the effect of the AAC system used on the interactional process itself. Some of the factors that impact on the communication process include:

- the attitudes and beliefs of the communication partner;
- the behaviours of the speaking partner;
- the multiple modes of communication, some used simultaneously;
- the use of a device and the characteristics of the device;
- the format of the message formulation and transmission;
- issues of positioning and mobility;
- context.

Observational data are described in this chapter although the perceptions of the peers, teachers and parents with regard to the interactions and social skills of Simon were measured before and after the intervention using qualitative measures. These included peer-referenced assessment strategies, sociometric measures, and qualitative analysis of interviews with teachers and parents. Additional qualitative pre- and post-measures included standardized self-concept scales and self-evaluation procedures that were completed by Simon.

Observational data were obtained from extensive videotaping in the natural context of the classroom during the normal school timetable. Videotaping was selected, as it recorded verbal and nonverbal information, provided an accurate portrayal of interactions taking place between Simon and his peers, and provided evidence that was accurate and verifiable. Filming was carried out during the teaching periods of three teachers across four school subjects – English, drama, human social studies and science. This strategy allowed for varied peer interaction opportunities that were representative of typical interaction opportunities throughout the normal school programme. The videotapes were then viewed repeatedly, and transcribed verbatim according to previously defined notation and transcription principles.

The transcription principles included that the transcription should provide a functional perspective of the interactive behaviours, that the context was an important and integral part of the interaction, and that the coding of each message should provide an adequate and systematic description of each message. Notational principles stated that equal
prominence should be given to the child using AAC and speaking peers, that equal value be given to verbal and nonverbal interactive behaviour, and that interactive behaviours be shown as integrated and complementary. Additional viewing of the videotapes resulted in coding procedures being applied. Any interactions not readily understood by the researcher were then shown to Simon who clarified the content and intent of ambiguous interactions.

In order to compare effectively the interaction of Simon with his peers pre- and post-intervention it was necessary to determine contexts that reflected differing levels of opportunity for communicative interactions within the classroom setting. The pilot study established that only three different contexts allowed for varying densities of communication opportunities. These were defined as follows:

(i) **Teacher-directed time** included periods of teacher instruction as well as periods when the students were engaged in independent academic tasks. Teachers expected that during these times students would not speak, with peer interactions discouraged. This context allowed for minimal peer interaction.

(ii) **Outcome-based educational (OBE) small-group discussion context**, during which the class was divided into small groups. Group members were expected to contribute suggestions and comments with respect to specified tasks. This context encouraged peer interactions related to the task at hand.

(iii) **Informal time context** included times when no teacher was present. This context allowed students to choose whether they wished to interact or not. Students also had relative freedom to choose with whom they wanted to interact, about what, and how they wished to interact.

4. **The effects of training**

Changes in Simon's interaction included the development of friendships, interaction out of the classroom and changes in the communication functions of his interactions with peers. Changes in his psychometric status and self-concept as well as changes in the responses of his peers were among the parameters observed and analysed.

Of interest was whether there was any change in the frequency or extent of Simon's interactions with his peers. Changes in the frequency of interactions (number of messages per hour) and in the extent of interactions (number of messages per interchange) were quantified using descriptive statistics. An *interchange* was defined as a coherent segment of interaction that was made up of one or more messages. Messages constituted the basic unit of analysis and these could be classified as initiations, responses or follow-ons. Additional parameters of the observed interactions that were of interest and were analysed included the discourse functions, communication functions and modes of communication used by Simon as well as the responses of the peers.

The increase in the frequency of the messages between Simon and his peers is graphically represented in Figure 12.1; 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 12.1 Mean number of messages per hour.](image)
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 time (context 3) the adolescents were free to choose whether or not they wished to communicate with peers.

The mean number of messages per interchange between Simon and his peer partners was also of interest, the hypothesis being that, should the peer training programme result in an improvement in the interactions between Simon and his peers, this would be reflected in not only more messages per hour but also the interactions increasing in extent. The extent of interactions was not measured in time but rather as the mean number of messages per interchange. These results are reflected graphically in Figure 12.2.

![Figure 12.2 Mean number of messages per interchange.](image)

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

The increase in the number of messages per hour (frequency of interactions) with peers following peer training was consistent with the findings of other research studies during which peer training was implemented (Calculator and Luchko, 1983; Carter and Maxwell, 1998; Hunt et al., 1988; Hunt et al., 1991). The low number of messages per hour of the adolescent with peers at pre-intervention was also consistent with findings that children who use AAC have few interactions with peers in school (Harris, 1982; Kraat, 1987; Light, 1988).

Results of the additional evaluation of the incidence of each of the defined types of discourse analysis, communication functions, modes used by Simon and the responses of his peers indicated the following:

(i) The most significant increase in the discourse functions monitored was in discourse maintainers supporting the evidence of an increase in the extent of interchanges. This was evident in all three contexts.
(ii) The most obvious increases relating to the communication functions of requesting or asking questions, and teasing, pretending, and using humour/sarcasm, were noted within the context of teacher-directed time. During the OBE small-group context the most obvious increases were the communication functions of answering contingent questions, requesting, expressing feelings/emotions and teasing. During informal times Simon showed the largest increases in the use of answering yes/no questions, requesting, as well as teasing and expressing feelings.
(iii) At no time during the study did Simon successfully interrupt the conversation of his peers. This was in contrast to most of his peers, who readily interrupted the conversations of other students.
(iv) The use of his natural voice remained the most preferred primary mode of communication by Simon with peers. However, his use of body movements also increased, particularly in the context of OBE small-group discussions.
(v) A positive factor of the peers' responses was a marked decrease in the occurrence of the peers ignoring Simon.

Challenges of peer training: issues and reflections

1. Lack of validated peer training programmes in AAC

The lack of validated peer training guidelines, procedures and materials was a significant barrier. There was a need for the development of peer training programmes as the peer partners needed to develop attitudes, knowledge and skills to assist their understanding and ability to be effective partners when communicating with other children who use AAC (Light, 1997). It may also be possible to adapt existing programmes that target social interaction skills. In their review, Cartledge and Milburn (1995) listed numerous studies that documented the effectiveness of peer-mediated intervention to train social skills with speaking children who have social-skill deficits. For peers to be influential in maintenance and generalization of behaviours the following parameters should be met:

- the skills targeted must conform to skills demonstrated by the peers;
- the peers must receive instruction and be included in the training sessions;
conditions to improve group cohesion and co-operation should be instituted (Cartledge and Milburn, 1995).

Peer groups are widely used in life-skills training and psychological skill training, including training in interpersonal communication skills with speaking children and adolescents. One of the benefits of using peer groups to develop skills directly related to the appropriate age of the students is that of mutual reinforcement. This is an important consideration in training the peers of children who use AAC to promote normalization.

It was also important that the training should focus on the quality of interaction and communication and not merely focus on parameters such as the number of exchanges.

2. Limited interactions between children who use AAC systems and peers

As discussed the social integration of children and adolescents who use AAC is frequently problematic. For many of these children both the quantity and quality of their interactions with peers are negatively impacted upon by the inherent disadvantages of using AAC, including the reduced rate of exchange and different expressive mode. Additional factors related to the AAC system may include limited or inappropriate vocabulary, limited range of communication functions, increased demands on the peer in understanding or even co-constructing messages, and the increased physical effort required. Individualized training programmes that include both the children who use AAC and their peers are one possible solution to this issue. Other strategies have included what Musselwhite and Burkhart (2001) have referred to as a Communication Circle, in their description of co-planned social scripts. The Communication Circle is a group of friends or peers of a child requiring AAC who are directly involved in the development of sequenced scripts with the child who uses AAC. The objective of co-planned sequenced scripts is to facilitate greater involvement of the child or adolescent who uses AAC with peers. The script categories described include action scripts, class/work participation scripts and conversation scripts (Musselwhite and Burkhart, 2001).

One practical guide to improving interaction between children that use AAC and their classmates is the handbook Children Using Communication Aids and their Classmates by Clarke and Price (2001). Three themes targeted by the manual include improving the attitudes and expectations of speaking peers, building interactional skills with both the children using AAC and their peers, and the development of the knowledge of the peers of the communication aids. Key components of the themes of ‘attitudes and expectations’ and ‘building interactions’ are identified, and games and activities suggested for each component. The activities for the theme of knowledge of communication aids are presented in quiz format in two sections: peer and staff knowledge, and peer and staff responsibilities.

3. Increasing opportunities to interact with peers

The strategy of increasing opportunities for communication is well grounded in the literature of both assessment and implementation of AAC. Greater emphasis needs to be placed explicitly on increasing the opportunities to communicate with peers for children of all ages. At critical times of risk for peer interaction, such as at times of change when a child who uses AAC transfers to a new class and, specifically, at adolescence, the peer interaction of students who use AAC needs to be carefully monitored. Even a child using AAC who has interacted well with peers and had many friends at elementary school may find that this changes at adolescence. Peer training may need to be considered at this stage for a child who, previous to this, was considered socially competent and socially accepted by peers.

4. Lessons from inclusive educational models

Models of educational practice need to be carefully considered to provide the best fit at a particular time for the individual child or adolescent who uses AAC. In low-income countries where mainstream schools do not have support for special-needs students, have very high learner-to-teacher ratios, and are frequently not accessible to people with physical disabilities, total inclusion could be detrimental to the child. However, low-income countries need to carefully review the lessons learned from industrialized countries and then adapt solutions to their own specific circumstances.

In their review of the ‘Critical issues in the inclusion of students who use AAC: an educational team perspective’, Soto et al. (2001) referred to a number of key indicators of successful inclusive programmes. Key indicators included:

- natural support from peers;
- social interaction between the student using AAC and peers both in the context of the classroom and out of school; and
- participatory membership of the student using AAC.

The latter included themes such as that the child using AAC had friends, was happy, not physically marginalized and that the school community accepted diversity and advocated for the students who used AAC. Significantly, another key indicator was that the classroom structure supported participatory learning, including the use of co-operative
learning and activities that built a sense of classroom belonging and community.

Participants from the focus groups in their study included general education teachers, inclusion support teachers, instructional assistants, parents and speech-language pathologists. They all noted the benefits of full inclusion for: the students who required AAC, their peers, the parents of students requiring AAC, the parents of peers, the teachers, and the overall classroom programme. Positive outcomes for the students who required AAC included increased academic expectations, increased social opportunities, receiving the same peer support as typically developing peers, improved communication and language skills, and a greater degree of independence (Soto et al., 2001). Several positive outcomes for the peers included increased academic achievement, learning by teaching and the ability to communicate with peers who used AAC (ibid.). Of additional interest was that the parents of children who used AAC were as, or more, concerned about the social inclusion of their child as they were about the academic inclusion.

Inclusive education using collaboration, co-operative learning, social-skills training and peer tutoring was an effective strategy to advance relationships between children with severe disabilities and their typically developing peers (Jackson, Ryndak and Billingsley, 2000). Peer-mediated instruction or peer tutoring was noted to have the dual outcomes of promoting learning and encouraging peer relations and friendships (Jackson et al., 2000). In their study on useful practices in inclusive education, Jackson et al. (2000) also refer to establishing a sense of community in the classroom, using techniques such as teaching children to advocate for each other, children sharing their similarities and differences, facilitating appreciation between students, finding valued functions for students with disabilities, and entrenching disability-related topics in lessons. Techniques to allow children with severe disabilities to participate as fully as possible with typically developing peers included using peer-buddy systems and adaptations to promote communication (ibid.).

The significance of focusing on improving the social and communicative competence of students who use AAC with peers is substantiated by the results of studies of mainstreaming in other countries. Communicative and social skills have been found to be better predictors of success in integration of children with disabilities than academic achievement (Goodman and Miller, 1980). Social interaction has been recognized as crucial to successful integration (Ostrosky et al., 1993) and is regarded as the essential criterion with which to measure the success of inclusive programmes (Halvorsen and Sailor, 1990).

5. **Criteria to assess the effectiveness of AAC programmes**

The effectiveness of AAC programmes with children and adolescents should be determined by how well the child or adolescent is able to meet the social and academic requirements of the classroom (Calculator and Jorgensen, 1991). As AAC clinicians and researchers we need to observe and understand the interaction opportunities and challenges faced by the person using AAC in their natural settings. We need to gain knowledge of how to improve the effectiveness with which children and adolescents who have disabilities and use AAC manage their daily interactions and discourse with peers.

6. **The viability of peer training**

The persistence of the intervention effects following what was a relatively short period of intervention in the study described earlier suggest that peer training is a viable option to include in the intervention of children and adolescents who use AAC. This is substantiated by the maintenance for two to three weeks of interaction gains noted by Light et al. (1992) after intervention of four 1-hour sessions with facilitators. Similarly, the respondents in the final field trial of the partner-training programme Developing Communicative Interactions (Sack and McLean, 1997) indicated that partner training had a positive ongoing impact on the interactions of persons who used AAC and who had severe developmental disabilities.

**Conclusion and implications**

Communication is essential for participation in daily life situations. Studies have shown that the implementation of multimodal AAC systems for children requiring AAC resulted in an increase in their interactions with adults, developed their language abilities and had positive effects on literacy development. However, the provision of an AAC system cannot guarantee increased social interaction, the main goal of AAC.

Implementation of peer training programmes, in addition to training the child or adolescent who uses AAC in social skills and strategies, should result in increased social interaction with peers. As mentioned, there have been few studies describing the effects of peer training on the interaction of persons who use AAC. Research studies are required to identify instructional and motivational factors that are essential for the success of peer training programmes and how these factors would differ in importance according to the age of participants. It is necessary to define which variables are relevant to the peer training process and the impact of each on the interaction skills of the child or adolescent who uses AAC. Additional
research to determine the effectiveness of different techniques in peer training would assist in determining which techniques are most effective. A comparison of peer training programmes would be instructive where one programme included activities in which peers have to communicate using AAC in simulated interactions, and another programme did not. An important contribution would be to establish whether extending peer training to include more natural settings, such as the playground, would result in greater generalization of the social interaction gains. Further studies may identify how the child or adolescent who uses AAC could facilitate the competence of peers in interactions. Speaking persons differ in the way they interact with persons who use AAC and it may be of value to identify and define which strategies used by speaking partners improve interactions. The evaluation of peer training programmes when included as part of inclusion programmes for students who use AAC would usefully explore and compare the experiences and perceptions of the student, peers, teachers and parents. Of additional interest would be the impact of peer training on the interaction of siblings with the child or adolescent who uses AAC.

In the same way that it is now expected that literacy is an essential component of any AAC intervention programme for children who have LNFs, it should be expected that no AAC programme is complete without the successful facilitation of social interaction with both familiar and unfamiliar peers.

References


