

## **CHAPTER TWO**

### **LITERATURE STUDY**

## **2.1 INTRODUCTION**

### **2.1.1 Scope of this chapter**

This chapter describes the role of teachers in facilitating interactions with AAC users in the classroom context. The importance of teachers' expectations, self-efficacy and attitudes are highlighted in terms of their influence, both on interactions and the successful implementation of AAC within the classroom context.

### **2.1.2 Background**

Teachers have diverse roles and responsibilities in schools serving students with LNFS (Locke & Mirenda, 1992). They play a critical role in supporting AAC strategies, as well as carefully planned intervention procedures. Furthermore, they are responsible for providing the AAC user with communication opportunities to facilitate their inclusion in classroom interactions, thereby improving the students' ability to meet the social and academic demands of school (Beukelman & Mirenda, 1992). Teachers are important interaction partners and their ability to facilitate interactions with the AAC user will greatly influence the success or failure of the AAC device as a communication tool in the classroom (Dalton & Bedrosian, 1989).

## **2.2 TEACHER-STUDENT INTERACTIONS**

It is important that there is adequate and sufficient interaction between students with LNFS and teachers in order to facilitate student learning. However, when teachers interact with students with LNFS, they are faced with the situation where the student

does not respond verbally, resulting in teachers feeling uncertain about the student. They react to these students with limited and altered patterns of interaction (Light, 1988; Basil, 1992; Cicognani & Zani, 1992). A consequence of teachers' limited interactions with students with LNFS is that students can adopt an exaggerated passivity and develop an attitude of "learned helplessness" (Basil, 1992). This attitude, together with limited access to interaction, results in limited social, academic and vocational opportunities for students with LNFS (Blackstone, 1989).

Research has revealed that the frequency of adult interaction with children increases as a function of the child's verbal abilities (Malamah-Thomas, 1988; Beveridge & Hurrell, 1980). Adults have also been found to interact less frequently with children with LNFS than with speaking children (Basil, 1992; Cicognani & Zani, 1992). Studies investigating teachers' interaction with students with LNFS indicated that teachers tend to dominate interactions by initiating conversations, taking more turns and maintaining control of conversations. They also utilize more direct questioning, attention directing statements and requests, and provide fewer answers, and less imitation and praise to students with LNFS than more verbal students (Cicognani & Zani, 1992). Furthermore, teachers' interactions with students with LNFS are confined to a small number and limited variety of utterances (Popich, 1997; Popich & Alant, 1997). The researcher suggests that while the students' verbal abilities had the greatest influence on teacher interactions, other factors may also have contributed to the interaction patterns observed. Factors identified as important to influencing interaction with students with LNFS included teachers' knowledge of the importance of interaction, their skill in incorporating the student into an interactive situation, the personality of the child, the teachers' ability to predict the students' performance on interactional tasks, teachers' attitudes towards the student and teachers' expectations of the student (Beukelman & Mirenda, 1992; Beveridge, Ramsden & Leuder, 1989; Light & McNaughton, 1993).

### **2.3 TEACHERS' EXPECTATIONS**

Teacher expectations are defined as the inferences that teachers make about the achievement of students based on what they know about the students' present performance (Larsen, 1975). Teachers' expectations are important, as they play an

important role in determining teachers' behavior, and thus in turn, that in turn influences students' responses (Zurroff & Rotter, 1985). It is important that expectations are appropriate, in order to enhance students' learning experiences thereby facilitating their progress through the curriculum at an appropriate pace.

While it is not understood how teachers' expectations are formed (Light & McNaughton, 1993), their expectations influence students in two ways. Firstly, expectations influence the priority given to an activity and, secondly, the expectations can be communicated to the student thereby influencing the students' own expectations of success (Light & McNaughton, 1993). Brophy and Good (1970), suggest a model of how teachers' expectations affect students' performance. They postulate that teachers have varying expectations for various students, which in turn informs the students on how they are expected to perform on an academic task. If teachers' treatment of a student is consistent over time, and if the student does not challenge these expectations, the student begins to exhibit behaviors that complement and reinforce the teachers' initial expectations.

Research trends investigating teachers' expectation highlight the link between teacher expectations and their subsequent influence on students' performance, teacher student interactions and responsiveness (Beveridge & Hurrell, 1980; Parsons, Kaczala & Meece, 1982; Light & McNaughton, 1993). Despite research indicating that teacher responsiveness has a positive influence on students' conversational abilities (Miranda & Donnellan, 1986), more than 50% of initiations of children with mental disabilities are not responded to by teachers (Beveridge & Hurrell, 1980). Teachers' responsiveness to students with LNFS is influenced by the personality of the child, the teachers' ability to predict the students' ability to interact and, finally, teachers' expectations of students. This is supported by a study that revealed that the high expectations of teachers are one of the factors that influences the development of academic skills in the mainstream population (Parsons, Adler & Kaczala, 1982). In addition, teacher' expectations of students influence their resulting interaction with students, as teachers provide greater interaction opportunities for students of whom they have higher expectations and whom they think will perform better on interactional tasks (Brophy & Good, 1970; Light & McNaughton, 1993). Another contributing factor to facilitating teacher-student interactions is the teachers' sense of

self-efficacy, which has been defined as teachers' belief in their own abilities to facilitate learning in students.

## 2.4 EFFICACY

Efficacy theory postulates that the most important variable in teacher effectiveness and subsequently student success is teachers' belief in their own abilities (Ashton & Webb, 1986). Efficacy has two distinct dimensions. General efficacy refers to factors beyond the schools' control that limits the teachers' ability to perform actions that promote student learning. Teaching efficacy or teachers' sense of self-efficacy refers to the belief that teachers have in their own ability to perform the necessary actions that result in students learning. This belief influences teacher-student interactions, students' achievement and teachers' motivation and effort (Ashton & Webb, 1986). Higher self-efficacy has been consistently found to contribute towards student achievement, self-esteem, and their expectations of students, and has been positively related to teachers' commitment to an instructional approach (Guskey, 1988; Ross, 1992).

For teachers' of students with LNFS, a sense of self-efficacy is particularly relevant because of the nature of the student population. These students require specialized instructional techniques and materials, such as AAC. Often teachers of these students do not have special training in working with children with disabilities and have limited knowledge and exposure to AAC. Hence, they feel threatened by AAC systems and may not feel competent when interacting with an AAC user (Baker, 1993).

AAC users in the classroom initiate conversations, use complex sentences, exercise control in interactions and exhibit communicative competence (Smith, 1994).

However, AAC users are not always functional participants in the classroom with students using a limited range of speech acts, infrequently interacting with their peers and rarely initiating interactions (Calculator, 1988; Todman & Alm; 1994; Basil, 1992). This ineffective and inefficient communication by AAC users and limited use of AAC restricts AAC users' opportunities. Inefficient use of AAC may be attributed to AAC being perceived as a magic device that allows for instant participation.

Hence, little emphasis is placed on acquiring the skills necessary to facilitate the successful use of the device. Furthermore, the focus of AAC intervention may be on improving verbal communication rather than facilitating interactions (Archer, 1977).

Adequate and sufficient interaction between an AAC user and a teacher is important, as the competency of an AAC user is closely related to the skill of the communication partner in interacting with the AAC user (Oslwang, Kriegsman & Mastergeorge, 1982). It is unreasonable, however, to expect teachers to facilitate interactions with an AAC user and assume a primary role in implementing AAC without providing teachers with training and support in this regard. Furthermore, training focussed on varying social factors (such as individual and group interaction) and functional communication goals (such as communicating basic needs and engaging in social communication interactions) has been found to increase the communication partners' skill in interacting with the AAC user (Landry & Lovelan, 1989; Busch, 1993).

## **2.5. TEACHER TRAINING**

Teacher training is an important element in the process of training AAC use and facilitates effective interaction with the AAC user (Dalton & Bedrosian, 1989; Mendes & Rato, 1996). Furthermore, literature indicates that the manner in which technology is integrated into the classroom is dependent on the type of preparation teachers receive, prior to its introduction into the classroom (Carney & Dix, 1992).

In addition to facilitating interactions, teachers play a primary role in implementing and supporting AAC in the classroom. They have the dual responsibility of developing AAC users' skills in utilizing AAC devices and their academic skills. This involves selecting vocabulary, writing goals and objectives for the AAC user and adapting the curriculum.

The level of qualification of teachers who are working with children with LNFS varies greatly, with many teachers having little or no training in working with students with disabilities (Alant & Emmett, 1995) or in AAC. Training should, therefore, focus on the development of teachers' operational strategies as well as the development of strategies to ensure the effective AAC implementation. (Blackstone,

1986). It is, therefore, important to train teachers in the areas of AAC systems, techniques, strategies, ways of interacting with the AAC user, adaptation of the curriculum, instructions, methods to use with the AAC user and finally in writing goals and objectives for the development of the AAC users' skills (Blackstone, 1989; Baker, 1993).

Literature indicates that training results in a change in teachers' interactions. They have been found to use more questions that promote the development of cognitive skills (Greenberg & Woodside, 1994). They have also been found to depend less on directive questioning and use more pauses (Todnem, 1994). Furthermore, research indicates that the more knowledge about AAC and experience teachers have the more roles and responsibilities they feel they are able to assume when implementing AAC. Therefore, in addition to in-service training, college courses and workshops, teachers need to develop practical experience with AAC users (Locke & Mirenda, 1992). Training is important as it can also facilitate a change in attitudes towards students. Research indicates that teachers have more positive attitudes as they have raised expectations of these students and better knowledge of their abilities (Wilson & Silverman, 1991; Mendes & Rato, 1996).

## **2.6 ATTITUDES**

The preferences and attitudes of teachers are important as these may pose a barrier to facilitating interaction with students. Attitudes may be defined as a mental state, organized through personal experiences which exerts a dynamic influence upon one's response to situations with which it is related (Allport, 1967). They have been conceptualized as comprising an affective, behavioral and cognitive component (Triandis, 1971). The affective component refers to the emotional association with a belief, the behavioral component refers to the readiness to respond in a certain way, and the cognitive component refers to the belief about an object or situation. Restrictive or negative attitudes that can form barriers are extensive and may be held by teachers. While attitudes may be blatant, they are more often quite subtle and insidious, due to people realizing that these views are socially unacceptable.

Insidious, restrictive or negative attitudes towards technology may result in the limited use of assistive technology, including AAC. Stineman (1998) suggests that limited use of assistive technology may be attributed to a variety of factors including: little or no improvement in function, breaking easily, being unreliable, being difficult to learn to use, being very stigmatized and not fitting into the individuals' home or work environment. Such factors are in contrast to the principle of affordability and effectiveness of services rendered, which are primary concerns in rendering services in the South African context. Other principles that need to be considered are the appropriateness of technology and whether the services are perceived as acceptable and appropriate to the persons receiving services. The principles of affordability, acceptability, appropriateness of technology and effectiveness of services are fundamental to the National Health Plan.

The principle of appropriateness of technology is particularly relevant to the current study, in order to avoid the lack of use of AAC. To ensure that this principle is addressed it is necessary to examine the beliefs or attitudes of teachers. Attitudinal barriers, as proposed by the participation model, are another reason for lack of use of AAC systems (Beukelman & Mirenda, 1992). Thus, it is possible that despite an appropriate AAC system being available, the AAC system may not be utilized or, alternatively, the AAC user may not be provided with appropriate communication opportunities, because of the attitudes of the communication partners of the AAC user.

Attitudes towards AAC users, as a function of the type of device being used is intriguing due to the possibility of the physical or design characteristics of the device influencing attitudes. Studies have attempted empirically to investigate the influence of various different AAC devices on the attitudes of the communication partner of the AAC user (Coxson & Mathy-Laikko, 1983; Blockberger et al., 1993; Gorenflo & Gorenflo, 1991; Beck & Dennis, 1996). However, these have been limited primarily to the attitudes of children, college students and staff members at institutions. The basic methodology of these studies involved subjects watching a videotaped interaction between an AAC user, using various AAC devices, and a natural speaker. Thereafter, their attitudes were measured using Likert type multidimensional attitudinal scales (Table 2.1).

Studies by Blockberger *et al.* (1993) and Beck & Dennis (1996) investigated childrens' attitudes towards similar aged peers who used various communication devices i.e. high technology aids (aided electronic) and low technology aids (aided non electronic and unaided). The results indicated that the type of device used did not yield significantly different attitudes of social acceptability. Similarly, persons with personal exposure to AAC users have displayed a preference for low technology devices because they make possible greater and more active involvement in the communication exchange.

However, research conducted on adults displayed attitudinal patterns that are in contrast with the findings of attitudinal investigations utilizing children. In an unpublished study by Coxson & Mathy-Laikko (1983) college students were found to have less favorable attitudes towards an AAC user of a low technology device (an alphabet board) than one who used a high technology device (voice output). In addition, Gorenflo & Gorenflo (1991) investigated the attitudes of able-bodied college students towards a disabled peer using high and low technology devices. The results revealed significantly more positive attitudes, as the method of communication became more complex. Hence, attitudes were most positive towards the computer based voice output aids, less positive towards the alphabet board and finally least positive towards unaided communication comprising gestures and vocalizations. The general trend that emerged from these studies is that adults exhibit more positive attitudes towards high technology devices, particularly those with voice output capabilities, termed Voice Output Communication Aids (VOCA). These more positive attitudes may be attributed to AAC users of high technology devices being perceived as more intelligent and, therefore, viewed more positively. Furthermore, it is postulated that high technology devices were perceived as "better" than low technology devices due to the numerous interaction advantages of a VOCA.

## **2.7 VOICE OUTPUT COMMUNICATION AIDS (VOCA)**

VOCA enables the AAC user to be an active participant in interaction (Lock & Piche, 1994). It makes it possible to interact in larger groups, over a distance and over the telephone (Kannenberg, Marguadt & Larson, 1988) and to talk with persons not



looking at the device, thereby reducing the strain placed on the listener (Rahavendra & Allen, 1993). In addition, VOCA provides the AAC user with the most natural form of communication (Musselwhite & St Louis, 1988) and it enables the AAC user to have the “normal” experience of hearing him/herself speak (McNaughton & Lindsay, 1995).

Furthermore, the VOCA user has more independence, as s/he is able to gain people’s attention with voice, rather than relying on others’ translations of his or her gestures.

The advantages of VOCA are supported by the study conducted by Schepis & Reid (1995) which found greater interactions between staff members and an AAC user when the AAC user used VOCA as compared to a communication board. In addition, Calculator & Dollaghans’ (1982) study found that students with LNFS rarely used their communication boards in spontaneous interactions with their teachers in the classroom setting, despite being able to utilize them in one to one interactions with others. The use of communication boards did not increase the likelihood of student success in providing a message or in decreasing the ambiguity of a message. The decreased use of the communication boards with the teachers may be attributed to the communication boards being unable to offer a means whereby the intent of a message can be communicated. This places greater demands on teachers as they must decode the students’ message and attempt to infer the intent of the message. By contrast, a VOCA in contrast places fewer demands on the listener in terms of decoding a message. However, a disadvantage of VOCA may be the reduced intelligibility of the device due to the poor quality of the speech output or robotic quality of the speech (Beukelman & Mirenda, 1992).

Considerable research has accumulated regarding the intelligibility of the voice output of AAC systems, in terms of acceptability and naturalness from a social perspective. Listener preferences of both sexes to natural and synthetic speech have been investigated (Mirenda, Eicher & Beukelman, 1989; Crabtree, Mirenda and Beukelman, 1990). The results revealed that female listeners had a strong preference for natural female voices (adult or child) as an acceptable replacement to their own speech. Males appeared more flexible about gender appropriateness for themselves but selected female voices for females. Gender appropriateness was considered more appropriate than age appropriateness in the rating of various voice outputs.

While research has focussed on investigating attitudes towards VOCA and various AAC devices, it focussed primarily on children, college students and the general population as is evident in Table 2.1. A descriptive survey was used as the standard method of obtaining data in these attitudinal studies. Research investigating teachers' attitudes towards AAC has been limited primarily to Sotos' (1997) study. This preliminary study investigated teachers' attitudes towards AAC and did not investigate teachers' attitudes towards various AAC devices. Her findings revealed that the majority of teachers surveyed had positive attitudes towards communication training for students with LNFS. Due to the paucity of research regarding teachers' attitudes towards students with LNFS using various AAC devices, the current study was conducted. It was postulated that the type of AAC device would influence teachers' attitudes and that a device with voice output capabilities would elicit more positive attitudes than a device without a voice output. Hence, the aim of the study is to determine teachers' attitudes towards a student with LNFS using two AAC devices viz. an Alpha Talker 9 utilizing voice output and a communication board.

## **2.8 CONCLUSION**

The general trend in research investigating the impact of the type of AAC device on attitudes is that adults exhibit more positive attitudes towards VOCA than towards a communication aid without voice output. VOCA elicits more positive attitudes and facilitates greater interaction with the adult population. However, there is a need to conduct more attitudinal studies of AAC users' communication partners, including teachers, so that their attitudes can be considered realistically and sensitively when planning AAC intervention. The attitudes of teachers are particularly relevant due to their attitudes influencing their sense of self-efficacy as well as their interactions with and expectations of students. In addition, teachers' beliefs play a pervasive and important role in classroom interactions (Kagan, 1992).

**Table 2.1: Summary of Attitudinal Studies**

No.	Researcher(s)	Year	Title	Main Aims	Survey Instrument	Video	Subjects	Research Design
1.	Gorenflo & Gorenflo	1991	The effects of information and augmentative communication technique on attitudes towards non-speaking individuals.	<ul style="list-style-type: none"> <li>To determine the effect an augmentative technique has on attitude.</li> <li>To determine attitudes towards alphabet board, VOCA</li> <li>To examine the influence of information on attitudes.</li> </ul>	<ul style="list-style-type: none"> <li>Attitudes towards non-speaking persons scale</li> <li>5 point Likert scale</li> </ul>	Quadriplegic spastic cerebral palsied male (22 years old)	Non-disabled undergraduate students.	Descriptive survey
2.	Blockberger <i>et al.</i>	1993	Children's attitudes towards a non-speaking child using various AAC techniques.	<ul style="list-style-type: none"> <li>To determine if children's attitudes changed according to the technique used i.e. alphabet board, VOCA and unaided communication.</li> </ul>	<ul style="list-style-type: none"> <li>Chedoke – McMaster attitudes towards children with handicaps (CATCH)</li> <li>5 point scale</li> </ul>	Spastic, diplegic female child (9 years 1 month)	Fourth grade able-bodied children.	Descriptive Survey
3.	Beck & Dennis	1996	Attitudes of children towards a similar aged child who uses augmentative communication.	<ul style="list-style-type: none"> <li>To determine children's attitudes towards an alphabet board, VOCA.</li> </ul>	<ul style="list-style-type: none"> <li>CATCH</li> <li>5 point scale</li> </ul>	Cerebral Palsied male (13 years)	Fifth grade able-bodied children.	Descriptive Survey
4.	Soto	1997	Special education teacher attitudes towards AAC: Preliminary survey.	<ul style="list-style-type: none"> <li>To examine and describe the belief of teachers towards the use of AAC by students with severe communication impairments.</li> </ul>	<ul style="list-style-type: none"> <li>Teachers' attitudes towards AAC</li> <li>5 point scale</li> </ul>	Not utilised	Special education teachers.	Descriptive Survey
5.	Mirenda <i>et al.</i>	1989	Synthetic and natural speech preferences of male and female listeners in four age groups.	<ul style="list-style-type: none"> <li>To examine the preferences of both sexes in four age groups towards natural and synthetic speech.</li> </ul>	<ul style="list-style-type: none"> <li>Questionnaires</li> <li>5 point Likert scale</li> </ul>	Audio cassette tapes	Male & Female able-bodied people from four age groups i.e. 6-8 year olds, 10-12 year olds, adolescents and adults.	Descriptive Survey
6.	Crabtree <i>et al.</i>	1990	Age and gender preferences for synthetic and natural speech.	<ul style="list-style-type: none"> <li>To examine the preferences of listeners to natural and synthetic speech.</li> </ul>	<ul style="list-style-type: none"> <li>Questionnaires</li> <li>5 point Likert scale</li> </ul>	Audio cassette tapes	Males and females from four age groups as specified above.	Descriptive Survey

## **2.9 SUMMARY**

In this chapter, emphasis was placed on highlighting the influence of teachers' expectations, attitudes and sense of self-efficacy on teacher-student interaction and the implementation of AAC within the classroom context. Relevant studies were discussed in order to emphasize the importance of conducting attitudinal studies, particularly with regard to teachers' attitudes.