

A comparative study of the attitudes of teachers at special and educationally inclusive schools towards learners with little or no functional speech using communication devices

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The aim of this study was to determine and compare educationally inclusive and special school teachers' attitudes towards learners with little or no functional speech (LNFS), using two Augmentative and Alternative Communication (AAC) devices namely a digital speaker (Alpha Talker™) and a communication board. At each school, teachers were divided into two random groups. Group 1 teachers viewed a videotape showing a learner communicating using a low technology communication device (communication board) followed by watching the same video of the communication board a week later. Group 2 teachers watched a video of a learner communicating using first the low technology communication device (communication board) and then the high technology communication device (Alpha Talker™) a week later. After each viewing, teachers' attitudes were measured using the Teacher Attitude Scale (TAS). The results revealed that teachers were generally positive towards both high and low technology devices. A comparison of educationally inclusive and special education teachers revealed no significant difference between these teachers' attitudes towards the devices.

Introduction

The mid 1980s marked the general movement towards inclusive educational programmes. The rationale for this integration of students with disabilities with able-bodied peers is based on legal, moral and educational grounds (Bricker, 1978). In South Africa, the right to basic education is enshrined in the constitution in which learners with special needs have the same right as nondisabled peers (Act 108 of 96) (Constitution, 1996). The South African Schools Act (South Africa, 1996) also states that learners have the right to be placed in an unrestrictive environment that facilitates respect and acceptance. Furthermore, the Consultative Paper in Special Education (1999:10) supports the participation of people with disabilities in all daily activities including school activities. This paper states that inclusion is important, as it is effective in combating discriminatory attitudes and aims to build an inclusive society. It places emphasis on the participation and nondiscrimination against all learners in the learning process.

The single most important element for successful inclusion is the attitude of teachers as well as teacher and administrator support (Mastropieri & Scruggs, 2000:27). Much has been written about the negative attitudes of teachers towards children with special needs as well as the influence that training and exposure to these children has on attitudes (Wilson & Silverman, 1991). Mastropieri and Scruggs, (2000:27) summarised the results of 28 surveys of teachers towards inclusion between 1958 and 1995. They reported little change in attitudes in the past ten years. Generally, teachers are in favour of some degree of inclusion, with teachers with a background in special education being more positive. They were less positive, however, about inclusion of students with severe disabilities. Furthermore, they identified the need for greater planning, materials and smaller classes for greater success with inclusion.

The need to investigate teachers' attitudes is important in view of the current emphasis on inclusion, both nationally and internationally. In addition, teachers' attitudes towards Augmentative and Alternative Communication (AAC) are important, as teachers play a primary role in implementing AAC strategies, and their negative attitudes may form barriers to interaction and the successful implementation of AAC strategies within the classroom context. AAC is an instructional approach that can facilitate students with little or no functional speech (LNFS) towards more fully realising their potential (Lloyd, Fuller & Arvidson, 1997:1).

It is estimated that approximately 39% of students with disabilities at special schools, i.e. for children with severe disabilities, have LNFS (Borrmann & Alant, 1997). These students' access to education is further hampered by their limited speech, as research indicates that teachers of these students adopt limited and altered patterns of inter-

action with these students (Light, 1988; Basil, 1992). Students' limited speech output results in teachers feeling uncertain about what the student understands, needs and prefers, thereby limiting the communication opportunities provided to these students and their access to interaction. The aim of AAC intervention within classrooms is therefore to enable students with LNFS to attain their fullest potential through meeting their communication and learning needs with effective communication skills (Musselwhite & St Louis, 1988) thereby facilitating their inclusion into educational settings.

It is particularly relevant to note that the Consultative Paper (1999:45) has accepted AAC as a medium of learning and teaching, thereby making the inclusion of AAC users relevant. AAC has been defined as the "supplementation or replacement of natural speech and or writing using aided and unaided symbols" (Lloyd *et al.*, 1997:524). Unaided communication refers to symbols that require only parts of the body (e.g. facial expressions gestures, signs and speech) to facilitate communication, while aided communication refers to symbols that use an external device or aid to facilitate communication (e.g. devices and communication boards). Aided communication can be further discussed in terms of low technology and high technology devices or aids. The former describes any electronic or non-electronic device that does not have integrated circuitry (communication board) while high technology (Alpha Talker™) devices do. Further high technology devices have print and or voice output (Lloyd *et al.*, 1997).

Voice output communication aids (VOCAs) provide auditory stimuli via speech synthesis, which is an added component to the current repertoire of AAC options (Church & Glennen, 1992). The VOCAs are reported to have advantages over non-electronic communication boards because of the presence of additional auditory stimuli (Romski & Seveck, 1988, 1993). Studies have yielded controversial results regarding the impact of VOCAs on users in terms of acquiring graphic symbols. While learners with severe mental retardation learned graphic symbols when taught with VOCAs (Romski & Seveck, 1992) other learners were equally successful in acquiring graphic symbols using other AAC strategies without VOCAs. However, with VOCAs, learning was more efficient and decreased errors were noted during learning. Research on VOCAs has also focused on areas such as intelligibility (Hoover, Reichle, Van Tassel & Cole, 1987; Koul & Allen, 1993; Miranda & Beukelman, 1990), listener preferences (Crabtree, Miranda & Beukelman, 1990), listener training (Mc Naughton, Fallon, Tod, Weiner & Neisworth, 1994), interaction patterns (Schepis & Reid, 1995) and attitudes towards VOCA users (Blockberger, Armstrong, O'Connor & Freeman, 1993; Gorenflo & Gorenflo, 1991).

Attitudinal studies are relevant particularly in the South African context where the National Health Policy outlines five principles

including affordability, acceptability, appropriateness of technology and effectiveness of services that need to be considered when implementing services (Department of Health, 1999). It would therefore seem important to understand teachers' perceptions towards AAC in order to ensure that their views on the acceptability of and appropriateness of certain technologies are understood in order to facilitate the rendering of appropriate technology and acceptable services.

Studies of teachers' attitudes towards AAC have been limited primarily to Soto's (1997:186) investigation that examined teachers' attitudes towards AAC. There is a paucity of research, however, investigating teachers' attitudes towards different AAC devices. Empirical investigations into the influence of various AAC devices on the attitudes of the communication partner of the AAC user have been conducted amongst 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. Results from the study with adults indicated positive attitudes towards high technology such as VOCAs (Coxson & Mathy-Laiikko, 1983; Gorenflo & Gorenflo 1991:23). Persons using high technology AAC systems, such as VOCAs, seemed to be perceived as more intelligent, and were therefore viewed more positively. Furthermore, it was postulated that these devices were perceived more positively due to the numerous interactional advantages of VOCAs. An investigation into teachers' attitudes towards children with LNFS using two AAC devices was conducted in schools for children with mental disabilities in the Northern Province (Dada, 1999). The results of the study indicated that teachers at the three special schools were generally positive towards both high technology and low technology AAC devices. Furthermore, there was no significant difference between the teachers' attitudes towards the two AAC devices i.e. the low technology (communication board) and high technology (Alpha Talker™) (Appendix A) which is a VOCA (Dada & Alant, 2001). A limitation of this study was that it did not focus on the attitudes of teachers at regular schools that cater primarily for typically developing children. The aim of this paper is therefore to examine and extend this research by comparing the attitudes of teachers at both educationally inclusive and special schools towards a learner with LNFS using a high (Alpha Talker™) and low technology device (communication board) using the Teacher Attitude Scale (TAS).

Method

Participants

The sample comprised 28 teachers at 4 schools in the Pretoria area (Gauteng) with a special and educationally inclusive school (catering primarily for typically developing children) in each of the two areas: namely Atteridgeville and Mamelodi. These areas are geographically comparable. Convenience sampling was used in selecting these schools.

The results revealed that 93% of the participants were female and 7% were male. Their qualifications varied with 60% having diplomas, 21% degrees and 7% had obtained only a matric certificate. Approximately 70% of the teachers had worked with less than five children with LNFS while 23% had worked with between 6–40 learners and a 7% had taught more than 41 students with LNFS. Teachers' experience with working with learners with disabilities varied from 35% having no prior experience, 22% having between 1–6 years and 43% having more than 6 years experience.

Materials and Equipment

Videotapes

Two videotapes that were developed as part of a Master's study (Dada, 1999) were utilised for the purpose of this study. A videotaped conversation of a 7 year old boy with athetoid cerebral palsy was made. He was judged to be equally proficient in using both the low technology communication board and a high technology digital speaker, by his school therapists. He was videotaped having a conversation using a communication board (Video 1) and an Alpha Talker (Video 2) with

an adult female who was not visible. Each video tape was taken with a Sony Handicam, began with a focus on the symbols, which was gradually zoomed out to focus on the entire AAC device and only the back of the learner was visible. The same overlay was used for both devices and the conversation was around the symbols that appeared on the overlay. Each recording was approximately 5 minutes long.

AAC devices

A page containing graphic symbols called Picture Communication Symbols (PCS) was utilised as a consistent and standard overlay for both the high and low technology devices. PCS is defined as a "set of symbols composed primarily of simple line drawings with words printed above them" (Lloyd *et al.*, 1997:537). The overlay consisted of PCS, which were arranged on paperboard and covered in transparent plastic. The overlay was 27cm × 47cm, and comprised 38 PCSs, and the dimensions of each symbol were 3.8cm × 3.8cm.

A communication board is a low technology device that "displays aided symbols" like graphic symbols, pictures or picture communication symbols (PCS) (Lloyd *et al.*, 1997:526). For the purposes of this study, the communication board comprised the overlay, as described above. Figure 1 illustrates this overlay.

A digital speaker is a high technology device that has speech that is "electronically produced when the human voice is recorded and digitised" (Lloyd *et al.*, 1997:529). The digital speaker utilised for this study has the trademark name of Alpha Talker. The same overlay, as described above utilised for the communication board was utilised for the digital speaker. Figure 2 provides an illustration of the Alpha Talker.

The Teacher Attitude Scale (TAS)

The TAS was developed as part of a Master's thesis (Dada 1999) and was based on the framework developed by Soto (1997) for measuring teachers' attitudes towards AAC (Appendix A). It was developed to assess teachers' attitudes towards children with LNFS using a 5 point Likert-type scale ranging from strongly agree, agree, uncertain, disagree and strongly disagree. The TAS comprised 35 close-ended statements. Statements were positively and negatively stated in order to counteract acquiesce type of responses. The statements were grouped under five areas, *viz.*:

- Section A: Teachers' perceptions of their own abilities; comprising 7 statements
- Section B: Teachers' perceptions of the child; comprising 7 statements
- Section C: Teachers' perceptions of classroom interaction; comprising 7 statements
- Section D: Teachers' perceptions of the AAC device; comprising 8 statements
- Section E: Teachers' perceptions of the communication interaction; comprising 6 statements.

Procedure and data analysis

A comparative survey research design was utilised for the purpose of this study. The procedure for this study required that the participants at each school be randomly assigned to two groups each comprising 14 teachers of whom 7 were special school and 7 were educationally inclusive school teachers. Group 1 viewed a learner using a low technology communication board followed by watching the same video tape recording a week later. Group 2 watched a video tape recording of the same learner using first a low technology communication board and then the high technology Alpha Talker™. After viewing each videotape recording, the TAS was provided to the teachers who each completed the attitude scale immediately.

In order to describe the data, frequency distribution counts were calculated for all the variables on the TAS, percentages and means were determined and presented in tables. Group 1 and Group 2 were compared in terms of:

- their perceptions in each section of the TAS

































I like that 	is easy 	I play with my friends 	reading 	maths 	I do exercises 	my mother 	to play 
don't like that 	is hard 	I enjoy books 	occupational therapist 	swimming class 	juice 	my father 	games 
it's fun 	I do 	work 	physical therapist 	computer 	the tuckshop 	my teacher 	I swam in the gala 
headpointer 	when 	spelling 	speech therapist 	my printer 	sandwiches 	school bus 	the easter holidays 

Figure 1 Communication board/overlay

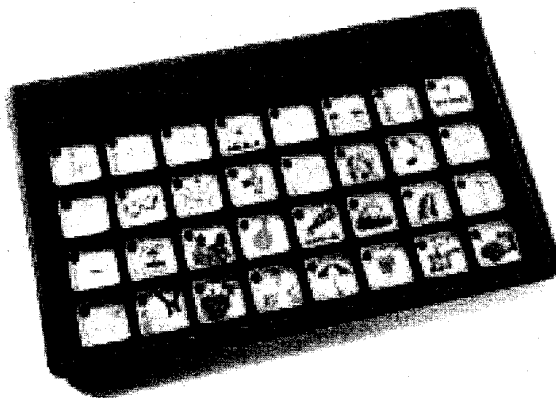


Figure 2 Alpha Talker

- their perceptions on the TAS as a function of the AAC device. This was done using the SAS procedures: Mann Whitney U Test and One Sample Wilcoxon Test, respectively (Guy, Edgley, Arafat, Allen, 1987; Babbie & Mouton, 2001).

Results and discussion

A comparison of teachers' attitudes on the TAS

Tables 1 and 2 provide an overview of the means obtained for educationally inclusive and special school teachers in Group 1 and 2, respectively.

It is evident that the mean scores for both groups were high. Hence, it appears that teachers were generally positive towards the learner using an AAC device, irrespective of the type of device. Teachers' attitudes are vital as their behaviour is guided by their thoughts, judgements and decisions (Shavelson, 1983). In addition, teachers' negative attitudes may serve as barriers to interaction and successful implementation of AAC devices within a classroom context. The generally positive perceptions are an important consideration as AAC intervention involves a team approach that includes teachers. There

has increasingly been a movement towards therapists providing support to teachers, while teachers retain the primary responsibility for implementing AAC in the classroom (Goodman & Kroc, 1981; Baker, 1993). It should, however, be noted that the mean scores for the Section A (Teachers' perceptions of their own abilities) were generally low for the educationally inclusive teachers. The means ranged between 2.3 and 2.8.

This indicates the need for teacher training, as teachers generally did not perceive themselves as being able to cope with these students. Teachers' beliefs in themselves or their sense of self-efficacy is an important indicator of student achievement, teacher motivation and effort. Teacher training is therefore indicated to provide teachers with the intrinsic belief in their own abilities to perform the necessary actions that result in student learning.

Teacher training is an important element in the process of training for AAC use and facilitates effective interaction with an 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

Table 1 Group 1 — Mean scores of teachers in educationally inclusive and special schools on the TAS

TAS section	Area	AAC device	Mean	
			Educationally inclusive school teachers	Special school teachers
A	Teachers' perceptions of their own abilities	Communication board	2.69	3.37
		Communication board	2.65	3.21
B	Teachers' perceptions of the child	Communication board	3.24	3.31
		Communication board	3.24	2.98
C	Teachers' perceptions of classroom interactions	Communication board	3.76	4.00
		Communication board	3.76	3.89
D	Teachers' perceptions of the AAC device	Communication board	3.64	3.80
		Communication board	3.09	3.64
E	Teachers' perceptions of the communication interaction	Communication board	3.64	3.93
		Communication board	3.14	3.86

Table 2 Group 2 — Mean scores of teachers in educationally inclusive and special schools on the TAS

TAS section	Area	AAC device	Mean	
			Educationally inclusive school teachers	Special school teachers
A	Teachers' perceptions of their own abilities	Communication board	2.35	3.45
		Alpha Talker™	2.88	3.14
B	Teachers' perceptions of the child	Communication board	3.06	3.14
		Alpha Talker™	3.41	3.31
C	Teachers' perceptions of classroom interactions	Communication board	3.12	3.65
		Alpha Talker™	3.47	3.82
D	Teachers' perceptions of the AAC device	Communication board	3.20	3.39
		Alpha Talker™	3.45	3.75
E	Teachers' perceptions of the communication interaction	Communication board	2.90	3.92
		Alpha Talker™	3.39	3.76

prior to its introduction into the classroom (Carney & Dix, 1992). In addition, training results in teachers changing their interaction patterns as well as attitudes towards students with disabilities including raised

expectations of these students and better knowledge of their abilities (Mendes & Rato, 1996).

To determine whether the difference in the educationally inclusive and special school teachers' attitudes were significant, the Mann-Whitney U test was utilised. The results are given in Tables 3 and 4 for Groups 1 and 2, respectively.

Table 3 Group 1 — Comparison of educationally inclusive and special school teachers' perceptions on each section of the TAS using the Mann-Whitney U Test

TAS section	Area	AAC device	<i>p</i> value
A	Teachers' perceptions of their own abilities	Communication board	0.02*
		Communication board	0.10
B	Teachers' perceptions of the child	Communication board	0.85
		Communication board	0.20
C	Teachers' perceptions of classroom interactions	Communication board	0.75
		Communication board	0.56
D	Teachers' perceptions of the AAC device	Communication board	0.56
		Communication board	0.16
E	Teachers' perceptions of the communication interaction	Communication board	0.47
		Communication board	0.09

* Significant ($p \leq 0.05$)

Table 4 Group 2 — Comparison of educationally inclusive and special school teachers' perceptions on each section of the TAS using the Mann-Whitney U Test

TAS section	Area	AAC device	<i>p</i> value
A	Teachers' perceptions of their own abilities	Communication board	0.01*
		Alpha talker™	0.19
B	Teachers' perceptions of the child	Communication board	0.31
		Alpha talker™	0.94
C	Teachers' perceptions of classroom interactions	Communication board	0.51
		Alpha talker™	0.28
D	Teachers' perceptions of the AAC device	Communication board	0.30
		Alpha talker™	0.13
E	Teachers' perceptions of the communication interaction	Communication board	0.03*
		Alpha talker™	0.13

* Significant ($p \leq 0.05$)

It is evident from Table 3 that there was no significant difference between the educationally inclusive and special school teachers in Group 1 in four of the five sections. A significant difference was evident in Section A (Teachers' perceptions of their own abilities regarding the communication board) ($p \leq 0.05$). This difference was evident only in the first viewing, which could indicate that teachers became more familiar with the way the learner interacted using the communication board, which may have been perceived as being less threatening in terms of technology. Teachers' sense of self-efficacy is important and has consistently been found to contribute to learners' achievement, self-esteem and teachers commitment (Guskey, 1988; Ross, 1992). It is evident that teachers in the educationally inclusive setting may have been less positive due to having less special training in working with students with disabilities as well as having limited exposure to AAC (Baker, 1993).

Group 2 on the other hand differed significantly on two sections i.e. Section A (Teachers' perceptions of their own abilities) and E

(Teachers' perceptions of the communication interaction) for the communication board only. It is postulated that the educationally inclusive teachers did not perceive that a learner would be able to meet the communication interaction needs of a classroom using the communication board. This may be attributed to the lack of a voice output (VOCA) that enables a device to have a "voice" which may facilitate greater interactions. Studies indicate that the VOCAs facilitate greater interactions as they allow interaction in larger groups, over the telephone and distance, and also reduce the strain placed on the listener (Schepis & Reid, 1995, Rahavendra & Allen, 1993). In addition, the communication board may have been perceived as requiring greater teacher involvement as the teacher would have to closely monitor students' communication attempts.

A comparison of teachers' attitudes towards the devices

Tables 5 and 6 reflect the teachers' perceptions of the devices used. The Wilcoxon test was utilised to determine whether a significant difference between educationally inclusive and special school teachers' perceptions existed. A confidence level of $p \leq 0.05$ was utilised.

Table 5 Group 1 — Comparison of educationally inclusive and special school teachers' perceptions towards the two AAC devices using the one sample Wilcoxon Test

TAS section	Area	<i>p</i> value
A	Teachers' perceptions of their own abilities	0.92
B	Teachers' perceptions of the child	0.73
C	Teachers' perceptions of classroom interactions	0.84
D	Teachers' perceptions of the AAC device	0.09
E	Teachers' perceptions of the communication interaction	0.19

Table 6 Group 2 — Comparison of educationally inclusive and special school teachers' perceptions towards the two AAC devices using the one sample Wilcoxon Test

TAS section	Area	<i>p</i> value
A	Teachers' perceptions of their own abilities	0.92
B	Teachers' perceptions of the child	0.34
C	Teachers' perceptions of classroom interactions	0.25
D	Teachers' perceptions of the AAC device	0.34
E	Teachers' perceptions of the communication interaction	0.46

The results revealed that no significant difference in teachers' perceptions of the device was found. Similar results were found in the study conducted in the Northern Province in which teachers at special schools revealed no significant difference in their perception of the two AAC devices (Dada, 1999). It is postulated that the lack of a significant difference in attitudes may be attributed to both technologies having been perceived as similar, that is, as a means of facilitating communication. Finally, the communication board may have been perceived as more acceptable, affordable and appropriate to their peri-urban context, as it is possible for teachers to make the devices themselves. The digital speaker, on the other hand, may have been perceived as uneconomical, in terms of the initial cost and maintenance

and repair of the device. In summary, both technologies were perceived as appropriate indicating the possibility of such technologies being used in the classroom.

Conclusion

In this study we described the attitudes of teachers at special and educationally inclusive schools toward students with LNFS using two different AAC devices. It provided insight into teachers' perceptions of their own abilities, and a learner's classroom interactional abilities in relation to the type of devices used. The most important finding of this study was that the teachers in both educationally inclusive and special school educational settings had positive attitudes towards AAC users. However, the teachers were less positive about their own abilities to cope with these learners, highlighting the importance of teacher training. Teacher training and support play a vital role in implementing and sustaining AAC services, in special as well as educationally inclusive schools, as there are often no additional therapists to support them. Training would provide teachers with knowledge and skills that could have positive implications for teachers' sense of self-efficacy (Mendes & Rato, 1996) as well as learners' learning. This is particularly relevant for teachers of learners with LNFS that require AAC implementation to facilitate their academic progress.

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