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THE SOCIAL MEDIATION OF AAC TECHNOLOGY EFFECTIVENESS: IMPLEMENTATION IN THE CLASSROOM

DISSERETATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
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*****

The Ohio State University
2002

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ABSTRACT

The study examines the ability of technology to facilitate students' participation in the classroom as well as benefits and barriers to social interaction and academic learning. This study is particularly interested in the teachers' assumptions about communication and their practices of implementing AAC technology to address concerns of nonverbal students inability (micro-culture of special education) to participate equally in the opportunities of education (macro-culture of regular education). Special education is a sub-culture of regular or standard education (Kalyanpur & Harry 1990). Inability to verbally communicate is a disability constructed from the values that are seen as important to the social process of schooling children (Kalyanpur & Harry 1990) in general education programs. Verbal ability is valued as imperative to the learning and social structure of U.S public school systems. Imperative to the inclusion practices of students with a disability is appropriate accommodations. For nonverbal students both language difference and technology are pertinent to their gaining the much talked about access to the linguistic codes of the dominant culture (Delpit 1988, Giroux 1995).

It was assumed by those in the district under study that classroom participation was dependent more or less completely on the individual disability or abilities. The central finding in this study shows that the social environment powerfully impacts the effectiveness AAC technology in the classroom.
I conclude that AAC technology is intended to improve the communication competency of the nonverbal person. In the classroom setting this potential may not be realized without the support and encouragement of the teacher and speech pathologist; otherwise, educators may unwittingly create disabling environments for the implementation and usage of AAC technology.

This research demonstrates the broad variety of ways AAC technology has been implemented in this district, and argues that such inconsistency can create unequal opportunities for students. Accordingly, a central recommendation of the study is that the social environment, particularly the extent to which classroom organization and teaching style is flexible, meaning it is left to the discretion of the individual professional, must be considered in order to chart the success of AAC usage in academic environment. In addition operational assessment and evaluation of both quantitative and qualitative measures should be considered or reevaluated to access the implementation AAC technology.
Dedicated to the two women who are the essence of my being

My Mother, Carol Barbour and

My Sister, Michelle Myles

And in Loving memory of

My Maternal Grandmother, Ada Irene Drew

My Fraternal Grandmother, Theresa White
Dedicated to Lowa Mwilambwe

My Husband and Best friend
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### VITA

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### FIELDS OF STUDY

Major Field: Education
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CHAPTER 1

THE PROBLEM AND ITS BACKGROUND

Introduction

Technology has received much attention within education literature, research and legislation in the past decade. The discourse of technology and language has been associated with discussions of race and ethnicity (Damarin 1998, Williams-Green, Holmes, and Sherman 1997, Delpit 1998), gender (Damarin 1990, Wajcman 1996, Haraway 1985) and disability (Edwards 1991, Hetzroni & Harris 1996). Educational researchers and theorist have also discussed technology in relation to access (Delpit 1998, Bernstein 1997), equity (Estrin 1993), social shaping (Hoare 1997), economics (Cuban 1993), cognitive abilities (Villegas 1991), and educational reform (Woodward 1992).

Technology research has frequently considered differences according to gender, race or other particular social conditions. The models and research for addressing technology in relation to language and disability within school settings have not generally addressed the intersection of technology, language, and disability as social and political constructs that impact the use of Augmentative Alternative Communication Technology (AAC) in the school system.
AAC technology is not just a technological device, but it is an intricate formation of the social and political constructs of language and technology. Foucault (Lemert & Gillian 1982) would refer to this as the inter-discursive relations between the discursive formations of language, disability, and technology. This was significant because language is the primary mediation tool in the classroom for communication and learning, the students in this study are limited in their ability to use language as a mediation tool in the classroom because of their speech impairments. Technology has been introduced to mediate speech so that these students may be able use language to mediate their communication and learning. Thus, understanding the various discourses that constitute the purpose of the AAC and the usage can help us understand better the implementation and potential of AAC usage in the classroom.

Students' participation and acceptance into the social processes of schooling depend on their ability to meet the prescribed standards of "normalcy" for participating. The prescribed standards are socially constructed, based on the values of the society (Kalyanpur & Harry 1990). As society changes so does the structure of its institutions. Historically, the way in which institutions of education educate their students reflects the social values of society. For example, the introduction of the concepts of "backwardness and "need" originally referred to immigrant students' failures in the form of physical deficiency and the conditions of their environment. So, schooling sought to address these concerns. The 1954 case Brown vs. Board of Education challenged the social values of educating students of color in separate schools. The Supreme Court set precedents that "separate but equal" schools should not exist in public education. Separate educational facilities were stated as being inherently unequal, thereby setting the groundwork for
proponents of the Inclusion movement. Historically, students with speaking disabilities have been educated in restrictive environments, removed from their speaking peers (Dunn 1968, Turner 1996). However current policy and reforms call for all students to This includes students with physical and cognitive disabilities. However, there is much debate over what is the Least Restricted Environment (LRE) appropriate for students with disabilities. According to Winzer (1998), in 1980, inclusion first emerged in special education literature when researchers called for a general education system that was more inclusive. Inclusion efforts are ambiguous and are supported by a variety of theoretical positions on who should and should not be included, are the teachers prepared and willing, is the classroom equipped (229)?

Imperative to inclusion practices of students with disabilities is appropriate accommodation. For nonverbal students, both language difference and technology are pertinent to their gaining the much-talked-about access to the linguistic codes of the dominant culture (Delpit 1988).

This study was particularly interested in the teachers’ assumptions about communication. It study also was concerned with the implementation practices of AAC technology to address nonverbal students’ inability (a micro-culture of special education) to participate equally in the opportunities of education (the macro-culture of regular education). Special education is a sub-culture of regular or standard education (Kalyanpur & Harry 1990). Inability to communicate verbally is a disability constructed from the values that are seen as important to the social process of schooling children (Kalyanpur & Harry 1990) in general education programs. Verbal ability is valued as imperative to the learning and social structure of U.S public school systems.
Conceptually and theoretically, this delineation may pose a problem for nonverbal students. Social theory contends that education is a social process that is realized through the social processes of language. Whereas social linguistic theory contends that language is socially constructed and is further developed through social interaction. However in early stages of language development verbalization is pertinent because children learn through talk (Dyson, Halliday, and Jaggar & Burke).

Kalyanpur & Harry (1990) assert that disabilities have been rarely viewed as a social problem; however, verbal disabilities clearly pose social consequences, which exclude children from inclusive educational opportunities. Therefore, AAC technology has the potential to provide its user with the means to verbalize. Augmentative Alternative Communication (AAC) Technology has consequently been introduced as a means to supplement verbal inability. The primary mission of the AAC device has been to assist persons with verbal disability to become and to remain communicatively competent (Beukelman 1993).

This research recognizes that the process is not that simple. Such deterministic perspectives suggest that if the AAC devices were used, then, they would work. However, from a social perspective, it is much more complicated and must take into account the discourses of language, technology, and classroom norms. More specifically the present study indicates the professional’s attitudes, preparation and assumptions about relationships between verbal and cognitive ability must be considered.
Statement of the Problem

Children with verbal disabilities have difficulty participating in education on equal footing with their verbal peers. It is problematic if the Augmentative and Alternative Communication technology these children are given do not allow them to participate in the culture of the classroom. Therefore, this dissertation was concerned with the question of whether the communication strategies that AAC users acquire allow them to function effectively within the culture of power or does it just, in Delpit’s (1998) words, “act as if power issues do not exist for children” with verbal disability? If this is the case, then, all we are doing for this population of children is allowing the power of the status quo to remain the same. In essence, if we do not address these issues of power, all we are doing is serving to reproduce the cultural and social capital of the dominant culture and thereby, leaving the AAC user with inequitable access educational opportunities.

Literature on child language development (Dyson 1992, Hartley, 1992, and Jaggar & Burke 1985) presents language as being socially constructed. The construction is premised on the ability to speak. The act of speaking is considered to be a key factor in language development. The ability to learn a language impacts upon the child’s experience in school. The nonverbal student lacks the ability to speak comprehensively, in other words; such a student’s level of verbal communication is not understandable to most people. This is problematic in that the inability to speak limits the opportunity to interact and negotiate to construct the language needed to participate in a school setting (Dyson, 1992, Jaggar & Burke 1985, Bernstein 1997).
For the verbally disabled child this process is augmented with an alternative communication structure and medium such as Augmentative Alternative Communication (AAC) devices. When language differences are not accepted as legitimate, communication and learning become problematic, thereby possibly excluding AAC users from successfully participating in the dominant culture of the classroom and society in general, which relies on verbal interaction. Language differences and technology are interconnected to AAC in that AAC is technology that has the potential to mediate language in the classroom.

Although the AAC device gives the verbally disabled student the ability to verbalize thought, the process and the technology is indebted to the social and political constructs of its components (i.e. language and technology) and relies on the acceptance within any situation (the classroom). Mackenzie and Wajcman (1999) states “some technologies are, in given social circumstances, more compatible with some social relations than others... In adopting a technology, we may be opting for more - economically, politically, even culturally, as well as technically - than appears at first sight(5).”

Furthermore, nonverbal students are, in a sense, in a double bind. They are considered language deficient and use augmentative tools that are not readily accepted in the classroom. Therefore, placing nonverbal students in classrooms, which do not value
language differences, is problematic for children with verbal impairments. When language and communication that are different from the ‘normal’ are not accepted, nonverbal students are at risk of not being able or allowed to participate. In addition, if technology is not accepted, as a legitimate linguistic strategy, it is possible AAC users will be taught less and will not be heard.

This research is significant because it examines the teacher’s implementation of AAC technology in the classroom. It focuses specifically on the explicit teaching of communication and the explicit usage of AAC within the classroom.

Education is considered a social process and language is the primary mediation tool in the classroom (Estrin 1993). However, AAC users are limited in their ability to participate in the social process of learning in schools due to their limited ability to interact verbally and must rely on augmentative tools to supplement their limited language scope. The nonverbal student may not participate in appropriate ways or may be excluded from the social interaction process in the classroom and ultimately the learning process (Mehan 1979), because classroom communication structures are distinctive in that they are based on the linguistic styles of the culture in power (Delpit 1995) and therefore may conflict with communicative styles of AAC technology. Language is also important in the process of evaluating one’s intelligence. Sims (1982) states that where teachers’ assessments of competence are influenced by the language children speak teachers may develop low expectation for certain students and subsequently teach them less, which links language to thinking.
Purpose of the Study

The intent of the study was to understand teacher’s perceptions of the device, their orientation to it, and overall processes of implementation. The discourse of language and technology in the school has been acknowledged; yet it has not been fully explored in relation to Augmentative Alternative Communication technology and educational opportunities. I am convinced that there is need for AAC to be understood better as part of a wider set of institutionalized social and political formations and relations.

The study examines the ability of technology to facilitate students’ participation in the classroom as well as benefits and barriers to social interaction and academic learning. In exploring the use of AAC System as it is intended to enhance the communication competency of children with verbal disabilities in relation to the communication structure of the classroom, the study also explores the practices and ideologies that either hinder or promote the creation of more inclusive education for verbally disabled students using AAC computer-based technology.

Research Questions

The study seeks to explore how nonverbal students experience schooling from a linguistic perspective. Specifically, the study addresses the following questions:

1. How do teachers perceive and use AAC technology in the classroom?
2. How does AAC technology supplant language impairments?
3. What impact does Augmentative Alternative Communication technology have on the inclusion of nonverbal students in the classroom?
4. How does AAC technology impact the social interaction necessary for education and language learning?
5. How does AAC technology impact participation in academic learning?
6. How does the relationship between the classroom language conflict and coexist with the AAC linguistic style and design?
7. How do the communicative strategies, ways of interacting, and ways of talking associated with the use of AAC devices facilitate students' participation in the classroom environment?

Assumptions

The present study adopted the assumption that social construction of technology, language, disability, and the institution of education play a significant role in the experience of the nonverbal student in the classroom using AAC devices.

The following are social assumptions associated with the nonverbal student's ability to speak; it is assumed that verbal ability limits;

1. limits the ability to socially interact with others verbally;
2. limits the ability to communicate and be understood;
3. limits the ability to demonstrate cognitive ability;
4. limits academic opportunity;
5. limits inclusion and participation;
6. perceived as cognitively low learner and;
7. renders the verbally disabled dependent on the knowledge of others.

The underlying assumption is that verbal disability is not just a factual phenomenon that exists within the individual (Mercer 1997), but it is a construct of the values of society. Not only is the verbal ability important to the development of language for children, but also "the ability to construct an oral text with another person is an essential part to the development of the adult linguistic system (Jaggar & Burke, 1985: 23)."
It is also, generally, assumed that technology is a solution to the social problem. Consider, hypothetically speaking, if verbal ability is associated with language development and language development is associated with social participation, it is legitimate to assume that as a student's verbal ability improves, that the student's language development and social participation will improve as well.

If we believe that technology has been shaped by social interaction and in turn it has the power to shape our social interactions and that our social interactions are centered around our language and our language is shaped by culture and the ability to interact with others, then, it would seem that understanding the experiences of nonverbal students in the classroom hinges on understanding the language and technology they both relate to nonverbal AAC user in the classroom. This study also assumes that if AAC technology is to facilitate verbally disabled students' interaction, then, the current classroom norms must be examined as they relate to language, technology, and nonverbal students' experience in the classroom.

The language literature states that "normal" children develop language through verbal interactions in which they can practice and negotiate. Augmentative Communication literature implies that AAC is an attempt to provide a solution for children's verbal disabilities. Despite the potential of AAC technology the study reveals that the classroom communication structure is different from the alternatives for these children, which places them and their language in a political struggle. The study further reveals that in order to improve nonverbal students' chances in the classroom communication must be explicitly taught. (Delpit 1995).
Summary

This research takes the stance that the nature and the meaning of human experience are socially constructed. For this reason, it is assumed that AAC technology is not just a technological device, but it is also an intricate formation of the social and political constructs of language and technology and its potential is questioned within the social context of education and education of students with disabilities.

In order to understand AAC technology it is important to understand the reciprocal relationship between AAC and the social world (Chandler 1996). Edwards (1991) states that the social aspects of the use of technology are less predictable and tractable than the complex components that make up the technology. Clearly, then, any full understanding of the impact of Augmentative Alternative Communication technology in the classroom experience of its users must include detailed knowledge of the social aspects of academic settings as they are designed to support students with disabilities and to redefine the purpose of the education process to produce a better life for these students.

Moreover, any understanding of the implementation of AAC must be based on the knowledge of influences exerted by social construction and social interaction of the development of AAC technology and AAC user. This is significant because AAC technology has the potential to provide a more equitable education opportunity for the nonverbal student.
This researcher assumes that this application could make unique contributions to both theory and practice: understanding the relationship between the social constructs of technology and language within the context of schooling has the potential to positively affect the integration of AAC technology into the educational experiences of a broad array of students.

Throughout this dissertation, it is apparent that computer technology, language, verbal disability, as well as classroom norms are the principal factors for charting the success of AAC use in schooling. Thus the study suggests teacher’s assumptions and actions both serve to either improve the implementation and usage or hinder the implementation of usage of AAC technology.

While inclusion and Assistive Technology are encouraged by legislation and a few in this central Illinois district, which was the site for this study, the culture of this district seems to project a somewhat contrary set of values. The data suggest that limited implementation represents the way in which the technology is viewed. Within this district the AAC technology is not widely accepted as a means to connect disadvantaged students to educational opportunities. The technology is used by those who understand its potential to meet the communication needs of students with verbal impairments. Thus, a few struggle to provide some consistency to the implementation of AAC technology in the linguistic development of nonverbal students. It is apparent that the social environment of the classroom impacts the potential of the AAC linguistic system.
In the first two chapters, I locate the study in the relevant literature and describe my research approach. In chapter 2, I review relevant literature to build a context for the study. I focus on interconnection of language and technology in the construction and the inclusion of AAC devices. In addition, I discuss critical theorists’ treatment of language, diversity and access to equal education opportunities.

In chapter 3, I sketch the theoretical framework I use to explore and interpret implementation and the usage of AAC technology for nonverbal students in this Central Illinois district. In addition, I describe the study’s research design, methods and limitations.

Chapter 4 describes an informal philosophy, which creates a flexible environment that is potentially disabling the inclusion of nonverbal students and crippling the impact of AAC technology. The focus is on barriers in the environment associated with authority figures actions in the classroom. The central argument in this chapter is that social factors in the environment such as teachers communication assumptions, collaboration, and understanding of the students’ ability to think as related to their ability to speak and access to curriculum, limiting language development, social interaction, inclusion, and access to general education curriculum for nonverbal students.

In chapter 5, I provide a picture of what it is like in an environment that does not explicitly teach language and communication skills and environments that do. I assert that inclusion is not just an issue in obtaining access to the general education classroom and curriculum, and that these children are also excluded from participating in social and academic activities in the self-contained classroom. It is apparent that while some of the students in the study used their devices in all activities others rarely used the devices at
all. It is also noticeable that although some students are more consistent in their use of the device, there are tensions between students' actual knowledge and the perceived knowledge (cognitive abilities). The authority figures way of thinking impact the students’ access to higher levels of knowledge, which further excludes them from participating in more equal ways. The current disability ideologies and practices limit what is taught and thus reproduce the separate education ideology despite Brown vs. Brown and the Individual Disability Education Act (IDEA).

The study implies that the authority figures communication assumption impacts on the implementation and the usage of AAC technology in the classroom. The data suggest that there is a relationship between the teacher’s communication assumptions and improved social interaction and academic learning. Though technology use has been legislatively mandated, and there is political backing to include children with disabilities in the classroom ("least restrictive environment"), the inclusion of the student and use of AAC technology was "largely left to social forces that are associated with the specific local experience of each child. So AAC’s potential is limited by the creativity and vision of the professionals." As well as the district’s flexibility in terms of handling special needs students. Therefore, the AAC must not be seen as a mere communication tool but as an educational tool to help the teacher understand more fully and develop the AAC’s potential in effort to assist the nonverbal student with their communication and learning
needs. Accordingly, the study raises the question of the extent to which the system is at least partially paralyzed by its disability to see beyond the traditional paradigms concerning educating children with differences. These traditional paradigms may inadvertently disable innovative teachers thereby creating disabling environments for the usage and implementation of AAC technology.
CHAPTER 2

SITUATING AAC TECHNOLOGY AND LANGUAGE IN THE SOCIAL PROCESS OF THE CLASSROOM

Introduction

This literature review will show that AAC technology is not just a technological device but is also an intricate formation of social and political constructs of language and technology and is therefore expected to interact within the social processes of the classroom. This study is particularly interested in the teachers' assumptions about communication and their practices of implementing AAC technology to address concerns of nonverbal students inability (a micro-culture of special education) to participate equally in the opportunities of education (the macro-culture of regular education). Special education is a sub-culture of regular or standard education.

Understanding the various discourses that constitute the AAC technology and its implementation is assumed will provide a better understand of the social and political impact its use has on the educational experience of its users.

Many technology researchers point out the complex interconnections between the social construction of reality, the nature of our technologies, and language. On the one hand, technologies are created to solve problems perceived to be present in the realities of their users and language is used to communicate. On the other hand, once a user has a technology available, that technology contributes to her or his reconstruction of reality.
and to the language that may constrain or enhance that reality. Researchers have used a plethora of paradigms, theories, and frameworks to explain and analyze the impact of technology and language on society. They have also attempted to explain society's influence on the adoption and acceptance of one technology over another and the legitimating of some variations of language over others. This review of literature addresses two aspects important to the study: language and technology.

Table 2.1

Table 2.1 provides a visual view of the interconnectivity of language, technology and the social context of the classroom. It also reflects that technology; language and the classroom are all social constructions, meaning they were manifested out of needs of human beings.
In this chapter, pertinent aspects of this phenomenon are reviewed in relation to technologies and language development, in general, as well as educational technologies and standard language, in particular. I consider the general issues which emerge from the literatures of these fields and how they relate to the lives of nonverbal students. I then consider AAC and describe the technology (both as a technological object and in terms of the social perspective on technology) and language and its effects on the educational experience of the nonverbal user. Finally, I discuss implications from a critical perspective of the issues related to technology and language in order to build a context for the descriptive data presented in this dissertation. This will help in understanding hidden social issues in education that have been decontextualized into policies of administration, which have obscured the interplay of social class, religion, ethnicity, race, gender, (Popkewitz & Shutkin 1995) and abilities which bring about the formation of certain types of education.

Disability and Education

The social context in which Augmentative Alternative technology will be considered is the practice of educating students with various abilities. In the early 20th century efficiency was a social priority whose goal was to maximize productivity. This concept was applied to education in order to eliminate waste. It was believed that people should be separated on the basis of mental capacities and provided curriculum according to these capacities (Popkewitz & Shutkin 1995).
However, according to Winzer (1998), in 1980, current ideas of inclusion first emerged in special education literature when researchers called for a general education system that was more inclusive, as we can see, inclusion is on-going and it is supported by a range of theoretical positions on who should and should not be included, are the teachers prepared and willing and are the classroom equipped. (229).

Full inclusion, according to Wright (1999), “means teaching all students in a regular education classroom, at their hometown school, with their age and grade peers, for the whole day with support services provided in that classroom. In short, full inclusion demands that support services be brought to the child rather than allowing the child to be moved to a segregated setting to receive special services (12)”.

Stainback, Stainback and Jackson 1992 quoted in Winzer (1998) state that the basic goal is not to leave anyone out of school and classroom communities; from the very beginning, focus is on support needs of all students and personnel (230).

The goal of inclusion is to provide equal opportunity for all children. Hanson, M.J.; Gutierrez, S.; Morgan, M; Brennan, E.L.:and Zercher, C. (1997) state the following as key efforts of full time placement of children with disability in a regular classroom: Inclusion is to improve social competence, attaining more advanced cognitive and communication skill and acceptance by others. On the other hand for non-disabled students the goal is greater acceptance of diversity (308).

In a study by Ross and Wax (1993) teachers expressed their concerns of lack of appropriate training, resources, knowledge of specific disabilities, modeling of effective teaching strategies and collaborative efforts with special education teachers. However, they reported that they found that children with disabilities could successfully learn in the
classroom and that the inclusion policy has impacted their teaching methods positively. Chow and Kasair (1999) studied the teacher-child interactions in an inclusive classroom. They acknowledge that there are some unresolved questions: "A host of questions remain unresolved. How can teachers in an inclusive classroom interact with typical learners as well as deal with the special issues presented by children with disabilities? Do teachers' interactions differ depending on the child's status? Who is most likely to get lost in the shuffle—children with disabilities, those at risk for school failure, or typical learners? (226)"

Inclusion of students with special education needs is supported by legislation. According to Wright (1999, 14) "the individual disability education act (IDEA) recognizes substantive rights for children with disabilities. The first is the right to a free, appropriate, public education. This right was affirmed and defined by the Supreme Court in Hendrick Hudson v. Rowley (1982). The second right guaranteed by the act is that education must occur to the maximum extent appropriate in the regular educational classroom with non-disabled students (IDEA, 1412(5))."

However, the success of including nonverbal students relies upon much more than legislation and policy; it is dependent upon those who deliver services (Mellencamp, 1993; Ross & Wax, 1993; Turner 1996).

Fuchs and Fuchs (1994) write that federal legislation for educating students with a disability is interpreted in a way that leads one to educational placements in least restrictive environments. This legislation states that in order to provide the social interaction between the disabled and the non-disabled student, who must provide access to the regular classroom for disabled students. This places social interaction as one of the
main reason for inclusion. However, Fuchs and Fuchs report that the “separate but unequal” stance does not recognize the nurturing and empowering nature of special education programs. Public policies did not take into consideration the social and political barriers (i.e. professional, attitudinal, and knowledge barriers within public education) nor did they consider that the structure of the school system itself would maintain a separate structure (Walker 1987).

There are many ways to explain inclusion. Turner (1996) provides six premises: All children will attend their neighborhood schools; students with special needs will be included in regular classrooms; all children will participate in all facets of school life; special education support will be provided for children with special needs; strategies will be used to promote social acceptance, friendship, and learning and; and students with and without special needs will receive the services of the general education teacher and the Special education teacher respectively. Inclusion is controversial and subject to the beliefs of those in the local setting. Janey, Snell, Beers, and Raynes (1995) conducted a study to obtain information about inclusion. One item that was considered important to success was about not wanting specific guidelines. Specific guidelines were considered to be a hindrance to the flexibility in an inclusionary setting (Janney et al., 1995, Turner 1996).
In the context of ongoing debates about where students with disabilities should be educated, this research is concerned with the relationship of the linguistic abilities and linguistic accommodations in these environments. The inclusion of AAC technology is expensive and must take into consideration social practices, as they are associated with language and technology. Therefore this research explores the social environment of the classroom and the language.

Language

The nature of language seems self-evident and it is not until one begins to try to explain or define what language is that we realize that it is so interwoven in the social fabric of our being that its construction is rendered almost invisible. Thus, before proceeding with the discussion of the shaping of technology, language, and society, it is important to define language in general and for this paper.

Language - as a communication system consisting of arbitrary symbols used by humans to organize, structure and store experience, knowledge, and concepts. Language is the primary instrument with which we express and transmit culture, maintain it, teach it, and adapt it (Trueba, 1989:29). There are 5 components that make up language:

- **Morphology** - aspect of language concerned with the rules governing change and meaning at the intraword level.
- **Phonology** - aspect of language concerned with the rules governing the structure, distribution, and sequencing of speech sound patterns.
- **Semantics** - aspect of language concerned with the meaning or content of words or grammatical units.
- **Syntax** - organizational rules specifying word order, sentence organization, and word relationships.
- **Pragmatics** - aspect of language concerned with language use within a communication context.
King (1985) states, "Language serves children essentially for two global purposes - to communicate with others and to learn." Jaggar & Burke (1985) explain that language development involves more than learning the forms of the language. Referring to Halliday, Jaggar and Burke (1985) note that language learning is made up of three parts: Learning language, learning through language, and learning about language. Emphasizing that all three processes take place side by side, reinforcing each other, Jaggar & Burke (1985) use Halliday’s research on children’s language acquisition as a framework for their study of children’s language. Halliday says that from a child’s point of view the three processes are all the same. But to understand these processes, we need to consider them separately in order to show how each enters into a child’s overall growth and development. The following is a list of emerging themes that have come out of children’s language acquisition research (Jaggar & Burke 1985).

- Language learning is a self-generated, creative process. Children learn language without explicit instruction.
- Language learning is holistic. The different components of language function, form and meaning - are learned simultaneously.
- Language learning is social and collaborative. Children learn language in meaningful interactions with others who provide models and support their learning by responding to what they are trying to say and do rather than to the form.
- Language is functional and integrative. Children do not learn language separately and then learn to use it later. They acquire language and learn to communicate with it simultaneously, and in the process also learn how to use language to think and learn.
- Language learning is variable. Because language is inherently variable, the meanings, the forms and the functions of children’s language will depend on their personal, social, and cultural experiences (Jaggar & Burke 1985: 4).
Dyson (1992) uses a social constructivist framework to discuss the changing role of written language in children's symbolic activities. Dyson refers to “Children’s use of letter forms as symbols that help them to represent and to reflect on their ideas and to interact with other people about them, as well as handwriting and spelling” (2). Dyson defines a symbol as a word, a picture, a dance that is intended to endow some tangible form such as a sound, a mark, a movement with meaning in order to participate in the social world. Dyson assumes that children construct their own understanding of the world and how symbols work by engaging in social activities with other people.

“Around age three, children begin to notice similarities between salient physical features of the world and their own graphic constructions. However, these discoveries come after their drawing, when they attempt to read the meaning of what they have made and, just as importantly, to communicate its potential meaning to other people. Dyson also discusses the functional use of speech in a child’s play. Dyson’s discussion is also of particular interest in that she states that speech allows children to represent meaning, to share their ideas with other people, and to engage increasingly in a more deliberate, more playful activity. Dyson informs us that guided by talk, children use sound and gestures to elicit action from others. Basically it seems that Dyson takes a functional constructivist approach to the use of symbols.
King informs us “children are born into a social world of activity in which talk is a vital part of experiences; they become part of the activity, explore with their eyes, turn their heads, and begin to make distinctions about the important things and people around them (20).” Jaggar supports Kings’s claim by stating “the ability to construct an oral text with another person is an essential part of the adult linguistic system which entails that ability to attend to words out of immediate context, to use appropriate grammatical forms, and to participate in dialogue. It represents the ability to use words, sentences, and other language options to construct texts which are coherent within themselves and within the context of the situation (Jaggar 1985: 23).”

Hartley (1992) further explains, “Symbols make up the way that people interact with one another, and can be an individual word or series of words. Symbols call out responses in the listeners. When a symbol answers a meaning in the experience of one person and tells that meaning to another person, it is called language (Mead, 1934 quoted in Hartley 1992: 5).”

Although five aspects of language were defined in this section, the phonology or “speech of language” and pragmatics or “communication of language” are of particular relevance in understanding language as it relates to the nonverbal AAC user. Deficiencies in these two areas will affect the student’s ability to learn language and to communicate and learn in general. It is assumed that there is a relationship between the
language development of a child and the experience within educational settings. There is a reciprocal relationship between thought and language and the way in which the language is used may influence thinking (Chandler 1996). The social and academic consequences of language, disabilities lead to the consideration and the importance of communication technology in the education process for nonverbal students, which will be reviewed in the next section.

Technology

In this section, the social aspects of technology are considered as they are introduced as solutions to the persistent concern about equal education opportunities for students with special needs. In this section, I look at technology from a general social perspective, asking what impact technology has had on society. Then I look at technology in the social world of education, in particular, the impact it has had on schooling, and inversely the impact schooling has had on technology. Hoare (1997) states that there must first be either a social need whether it is economic, political or military in its origins or an unsatisfied academic or technical curiosity for the advent of a technology. Thus, understanding the impact of a technology requires studying the "reciprocal action between the technical and social factors -‘social’, including economic, political, legal and cultural (Benthall 1976: 145)". Finally, I use both the general discussion and that of education to situate Augmentative Alternative Communication devices within the social context of schooling so as to understand the practices, perspectives and knowledge that surrounds the implementation of AAC as a solution for language deficits.
As technology is discussed today we assume that the term refer to electronic devices, often those associated with the computer, such as the Internet, email, distance learning, and virtual reality. Many times, these are the most talked about when discussing issues of education and technology. However, there are other areas and definitions of technology that are important to the discourse of educational technology and it is this discourse that will help us to understand the interconnectedness of technology and the nonverbal students' needs. Judy Wajcman (1996) illuminates the different levels of the definition of technology with the following definition:

Firstly, 'technology' is a form of knowledge, as Staudenmaier emphasizes. Technological ‘things’ are meaningless without the ‘know-how’ to use them, repair them, design them and make them. ‘Technology’ also refers to what people do. ‘Steel making’, say is a technology: but this implies that the technology includes what steelworkers do, as well as the furnaces they use. So ‘technology’ refers to human activities and practices. And finally, at the most basic level, there is the ‘hardware’ definition of technology, in which it refers to sets of physical objects, for example, cars, lathes, vacuum cleaners and computers (Wajcman 1996: 14-15).

As we look at this definition and its relationship with the study at hand we will come to understand that the social construction of technology through social interaction of humans bears on all three of these definitions as a whole, particularly, when we discuss Augmentative Alternative Communication devices. The AAC device represents knowledge, human activity, and hardware - the technological device itself. This will be discussed later in more detail; however, here we note here that Augmentative Alternative Communication technology is a combination of hardware, knowledge and human interaction. Thus, not only is the hardware a technological object, but also the picture coding and language is technology as well.
Historically, we see that technology has invaded every aspect of our lives from the time we wake up in the morning until we go to sleep at night. We can simply look around our homes and come up with a list of technologies, starting with the sound of the alarm clock announcing it is morning. As we move from our beds and turn on the light, we can see that the house of today is a habitual nesting ground of technological advances over the years.

"To fully understand the nature of machines, we must consider the culture that uses and profits by them. The machine as a cultural form, as a symbol, embodies the interest of those behind it serving those who will benefit from its existence (Muffoletto 1995: 92)." Here, Muffoletto is referring to machines; however, the term of choice for this paper is technology. Muffoletto points out two agents of the machine (technology): those who are the users and those who profit from the machine (technology) itself. Technology has been categorized (domestic, military, reproduction, educational information, communication, etc.) and has had varying effects on the different aspects of society; nonetheless, each has served in the construction of society, as we know it today. For example, the microwave oven was originally designed for military use to cook meals in submarines. Today it has been domesticated and is one of the major appliances within the home. The microwave has not only served the military but today it has changed the structure of meal times at home. It has allowed for more flexibility in the family roles because of the availability of minute meals. It also has economic effects within the market place and the grocery budget. Now you see more and more items that can be made in the microwave; you see more products that can be purchased and used in the
microwave. Another example, which is the washing machine, has served to construct or reconstruct the reality of women and their task in washing clothes. As quoted from Damarin’s (1990) Unthinking Educational Technology:

Feminist unthinking of the notion that the automatic washing machine is purely and simply a boon to women has uncovered numerous effects on the lives of women in addition to the obvious fact that washing any given load of clothes is a lot easier than it was (Cowan, 1983). As a direct result of the new technology, the activity of washing clothes is no longer a scheduled activity restricted to a particular day, but takes place “as needed.” Generally speaking, people have more clothes in need of washing and in need of special attention as they are laundered. Standards for laundering have changed requiring colors brighter and whites whiter than white. Clothes’ washing today is a solitary activity rather than the peer group or mother-children activity it was in the past. Thus, the automatic washing machine has changed substantially the daily lives of women, imposing new standards, schedules, and structures on them, at the same time, the social credit for laundering has been denied women by the notion that the automatic washer, not the women who operates it takes care of the wash (Damarin 1990.)

The common purpose of technology stemmed from the need to make life easier and for economic purposes. We are reminded by Damarin (1982) that “computers were first invented to perform dull and laborious tasks that human beings, in general, would rather not do (2).” They are to provide a way to produce, disseminate goods and products in larger quantities more efficiently. They provide access to information and knowledge more quickly and more easily. Technology serves both a functional and economic purpose. In reviewing or exploring the history of any particular technology its impact or nature may be realized. Society shaping technology and technology reshaping society is a circular process that is never ending. There are generations who will never know life without the television, microwave, computer games, blender, food processor, refrigerator,
stove, lawn mower, and car, just to name a few. Technology has become an inextricable part of society. This is a result of the social interaction of these entities. However, the education system has not had the same success with new technologies as a whole.

Thus, we move to interconnectedness of what society refers to as ‘new technology’ within the context of the institution of education. What is the ‘new technology’? Basically, this refers to those technologies relating to the production, dissemination of information and knowledge and the facilitation of communication. Initially, these technologies were not intended for educational purposes, but were meant for military and business uses. The interaction within this realm has allowed these technologies to find their way into the institution of education. If we look at the history of education and society, we see that economics and politics have always played an important role in the structure and restructuring of education in the form of reforms. Technology has not and is not exempt from the social forces of politics and economics, which now seek to market communication technologies as an educational tool. Like Wajcman (1996), I will question social relations associated with the use of AAC technology as a linguistic form. The contextual focus of this study will be on the social context in which AAC is implemented in the classroom.

Educational Technology

With massive technological changes in the work place and in daily life school reformers throughout the last decade have increasingly turned to computers in schools as a solution for inefficient teaching with textbooks to the whole class and as a means of cracking what they viewed as calcified bureaucracies. Hundreds of formal reports from corporate leaders, foundations, professional association, and federal agencies have consistently underscored how schools have failed in achieving their purposes and how important schools are to the nation’s economic success. (Cuban 1993: 188-189)
Proponents of educational technology hail technology as a necessity. It is a must for the children of today. In addition to the goal to provide technology for all Americans, there is another strand of technology that can be counted among the group of 'new technology', that is 'Adaptive and Assistive technology'. Some of these technologies are the same as often educational technologies; however, depending on the ability and disability, there are some alterations (e.g. laptops with modifications).

The way we see educational technology is directly related to the way we approach its implementation and value within the educational system and society at large. The social shaping discourse in society is not new. Much has been written over the years, debating whether technology has changed the values and the structure of society or if society in fact has shaped technology to meet some preconceived solution to some societal problem. This is the reason why we have what Donna Haraway (1985) calls a dualistic approach to educational technology. On one hand, people believe it is the salvation of education and on the other hand, the destruction of our youth. Donna Haraway suggests that it is not just the use of computers or technology that is an issue. Haraway’s article questions the very nature and construction of the values and the purpose of technology in society. She discusses the nature of the cyborg and its relationship with what it means to be human and implies that we are closer to the cyborg than we think. She states that computers are us because they embody our values. Educational technology, unlike the general discussion of technology, typically falls more within the technology determinist\(^1\) paradigm or prescriptive technology in that

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\(^1\) Chandler, Hoare and MacKenzie and Wajcman discuss both a hard and soft standpoint of the deterministic perspective. The hard deterministic perspective assumes that technology is the cause or determining condition of societal or behavioral change. It is assumed or believed that it will transform our environment and the way we think. It also takes on the belief ... that the existence of technology will
educational technology is seen by many as a cure for educational ills; if we just use it, it will work. As we view the two sides of educational technology, it is clear that the social world of the teacher, students and the dynamics of the classroom has not been influential in the development of educational technology that is being constructed for their consumption. The push is related to the national and economic goals of our nation.

Damarin's paper presentation, *Unthinking Educational Technology*, concurs with this notion. Damarin (1990) tells us that teachers use educational technology because of requirements from administration. The development of technology has occurred outside the social environment of the teacher and the students. Thus, she states that if the designs and development were not done with the teacher, then, the process of implementation is not typically in alignment with the teachers' agenda.

Woodward (1992) looks at technology through the framework of educational reform. He explains how the social interactions and the culture of the classroom have not been considered when it comes to the implementation and the success of computers within the classroom setting. Woodward quotes Cohen in saying that the conflict and the nature of technology in the classroom are being constructed outside the institution of education. It is situated within a social landscape that does not take into consideration the social history of the classroom and social conceptions of the classroom purpose. Nor does it consider the agents of the classroom. Cuban (1993) explains that most educational reforms have been coupled with national reform movements; but that was not the case.

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inevitably lead to its use, for good or ill (Hoare 1997: http://homepage.tinet.ie/~jhoare/tecvsoc.htm, 4/12/2000).” The soft standpoint simply implies that a phenomenon is the major or key factor in societal or behavioral change (Chandler 1996: 4/12/2000; MacKenzie and Wajcman 1999). In addition, Chandler (1996) includes the socio-cultural determinist standpoint in that the phenomenon is subordinate to the societal factors. And finally he mentions the voluntarist standpoint that gives agency to the individual to take it or leave it (http://www.december.com/cmc/mag/1996/feb/chan4sp.html). For this paper, these standpoints will be merged and discussed as one overall perspective and referred to simply as deterministic.
with technology. It was not until the period 1980 – 1990 that technology was included in the rhetoric of reform. He further states that the marginal use of technology in education has more to do with dominant cultural beliefs about what constitutes teaching, learning, and organization in schools for instruction than to issues of economics and access (Cuban 1993).

Even the language used for educational technology is implicated. Classrooms are being designed for the use of technology. Why are we not seeking to understand the social interaction and dynamics of the classroom and designing technology as such? 'Educational Technology' is a play on words to encourage the use of technology within the educational system. This is an example of Smitherman’s (1991) language as construction of social change. She discusses the change in language, in the reality of the African American, however, it applies here too. Unlike Smitherman’s account, which will be further explained later this change is occurring outside of the very institution it expects to benefit.

If we take a social view, then the primary stakeholders would need to be, at minimum, considered in the design of any technology for their consumption. The approach taking within the institution of education is very deterministic. Accordingly, “Radical innovations such as microcomputer ignore the constraints and contextual pressures that generate a much more modest and durable ‘tell and test’ (Cuban quoted in Woodward 1992: 5).”
Many pro-technologists take the stance that if technology is only used, it would render positive results. Historically and politically, technology that is applied in educational situations (Educational Technology) is not simply technology that has been created for the sole purpose of education and improving students' academic success or improving teacher performance. As explained in Woodard (1992), the integration and the use of computers are being pushed upon schools from the top-down. Yet, typically, the inclusion of computers conflicts with the norms of the classroom and the teacher’s daily agenda. For this reason, computers are seen as another “burden in the array of competing social messages about education (4).” This is not to say that computers have not experienced some success, though those occurrences of success can be interpretive based on economics and power. Furthermore, computers will continue to permeate our lives, and thus access will become a major issue as to who benefits from technology.

In this respect, Cohen (1987) It is apparent that the technology revolution will occur on the periphery of schools (Cohen quoted in Woodward 1992: 9)”, at least until educational technologists care to invite the social world or lives of those in this area as co-constructors.

In addition, the United States Department of Education’s policy on educational technology states that children will need to be technically literate due to the global shift our world has taken. It also promotes technology as a way to facilitate improvements in education.
The Office of Educational Technology (OET) encourages and leads education improvement efforts by helping educators, congressional leaders, and administrators utilize available resources to reshape instruction, teaching, and learning environments. OET plays an integral role in expanding and improving access to technology and serves as a catalyst in bringing effective uses of educational technology into classrooms across the nation. (United States Department of Education Office of Technology. Online: http://www.ed.gov/Technology/, May 20, 2000)

and

Since the 1996 release of the nation’s first educational technology plan, interest in increasing the use of technology in education has catapulted to national prominence. This interest has been spurred by the widespread recognition of the transformations technology is having on the American economy, as well as by the potential for technology to transform the teaching and learning experience. A growing sense now exists that there is a critical mass of opportunities to make tremendous strides in improving the nation’s schools. In recognition of these opportunities, the Office of Educational Technology has undertaken a strategic review and revision of the national educational technology plan to be completed by fall 2000. (United States Department of Education, Office of Technology. Revising the 1996 National Education Technology Plan. Online: http://www.ed.gov/Technology/, May 20, 2000).

Although there is much pressure to use technology in the classroom is not used much and in most cases technology has not been designed with the knowledge of its user.

Augmentative Alternative Communication

Technology is one social and political construct that must be increasingly accepted as a legitimate part of the nonverbal students’ communication strategy.

Augmentative Alternative Communication (AAC) Technology serves children who are not able to speak and has been introduced as a means to provide them with the mechanism of verbal communication.
Low-tech forms of AAC can be as simple as a table of words or pictures; communication takes place by the user pointing to the words or pictures, which the listener can read. An obvious disadvantage of this strategy is that the listener must be able to read (Edwards 1991).

The AAC device that I use in this study is considered ‘high tech’, meaning that it is made up of an interface, a coding and processing information system and voice production. The primary focus of the study is those systems that use pictures or symbols as input. The hardware is coded so that output is verbal language as we know it. This is similar to the electronic picture books, the only difference being in the ability to program the device to suit the users needs. "The primary mission of the AAC field has been to assist persons with severe communication impairment to become and to remain communicatively competent through the effective application of today’s knowledge, technology, and skills base (Beukelman 1993: 64)."

The AAC field is encouraged to “view the communication competence of AAC users within the various contexts of their lives rather than within a narrow research or educational framework (Beukelman 1993: 64).” Light (1989) explains communication competence as the ability to communicate to meet daily needs. This ability is premised on the “integration of knowledge judgment and the skills in four areas: linguistic, operational competencies refer to knowledge and skills in the use of the tools of communication; social and strategic competence reflects functional knowledge and judgment in interaction (142-143)."
As I discussed in chapter one, I observed that culture plays a role in the way children communicate, draw meaning and learning. Hetzoroni and Harris (1995) state, that cultural elements must be taken into consideration in order to avoid alienating the AAC user. They address the issues of culture in developing AAC to allow its users to communicate in culturally relevant ways. They are referring to a perspective that allows the user to be able to talk within his or her community’s vernacular. One example that is presented is the culturally appropriate greeting. “For example, an African-American AAC user who uses a voice output device may need to have a culturally appropriate greeting programmed that says, ‘what’s happening Sis?’, this message, according to Hetzroni and Harris, would replace the formal greeting of ‘Hello, how are you (52)?’

AAC Technology, Knowledge and Social Relations

The needs and the social/cultural interactions of the society serve to shape technology and language. It is important to note that social interaction is not just a linear shaping of technology and language, but it is a circular process of negotiation and reshaping. Thus, language within the social and political landscape of education, which in itself is political, is important for an understanding of the interconnectedness of technology, language and the social world of education when considering AAC technology and its user. Encoded within the technology, according Postman (1993), are the criteria for social relations.
Taking on a theoretical stance that all technology is constructed within a social context and that no technology is therefore neutral, Langdon Winner (quoted in Mackenzie and Wajcman, 1999) undermines the notion that technologies are in themselves neutral - that all that matters is the way societies choose to use them. He argues that they can be inherently political. This is so, he says, in two senses. First, technologies can be designed, consciously or unconsciously, to open certain social options and close others... Second, Winner argues that not only can particular design features of technologies be political, but also some technologies in their entirety are political" (Winner, quoted in MacKenzie and Wajcman, 1999: 4).” It is naïve to simply view technology as neutral; scholars have demonstrated that technology is conceived and constructed within specific circumstances and has implications for social relations. Therefore, in considering technology for people with verbal disability, we must consider the AAC devices in context of this discussion that has been outlined in the literature review of politics of language and technology. Mackenzie also states that technology is political, whether it is consciously or unconsciously designed to be so. It is inherently political for the fact that it cannot serve all people at all times (MacKenzie and Wajcman 1999). Wajcman gives a feminist perspective of the political nature of technology in that she emphasizes the male dominance of the design, maintenance and control of technology. Haraway (1985) also gives us a feminist perspective of technology in that she refers to technology as a cyborg, a hybrid of man and machine. This also emphasizes the conceptual framework that technology is a social construction that is based on the social
values of human beings and the interaction with machine. Thus our technologies embody a society’s values and thoughts. The question, then, becomes: How does this political structure impact the social construction of the AAC users’ experience in the classroom?

The machine itself is designed in the hope to supplement for people who are unable to verbally communicate. However, the use of any technology is determined by the structure of the technology (Postman, 1993).

Communication is important in the social interaction and negotiation of our identities and is intertwined with our ability to participate in the social interaction, which creates or helps us to realize classrooms and our society. Educational theorists recognize that speaking is fundamental to classroom interaction and that classroom communication encompasses those theories and skills that are associated with the process of verbal interaction (Lynn 1976). The stated purpose of AAC is to provide the medium for communication. However, in certain situations the machine’s design can limit the very interaction needed for one to participate in the negotiation and social construction of ones own reality that it espouses to create. This is supported by MacKenzie and Wajcman (1999) in that they state: “some technologies are, in given social circumstances, more compatible with some social relations than others...In adopting a technology, we may be opting for more - economically, politically, even culturally, as well as technically - than appears at first sight (5).” Thus, a central question arises: What are we opting for when choosing to use AAC devices for non-speaking students?
Wajcman states, “New technology typically emerges not from sudden flashes of inspiration but from existing technology by a process of gradual modification to a new combination of existing technology (MacKenzie and Wajcman 1999: 21). The AAC device is not just made up of a single technology, but it is conceptually constructed from various technologies that have already existed. If this is the case, then, the AAC device also embodies the political nature of all its parts. Therefore, if computers are male-dominated in general then computers are also male dominated in respect of the AAC device. Because men largely handle the field of programming and software design and because the technology embodies the values of its designers then it is logical to assume that the AAC technology is male-dominated.

Two obvious parts are language and computer. The computer can be further divided into other parts such as speakers, recorders, chips, memory, etc. Likewise, the language has various components such as, speech, meaning, symbols, etc. Given the three different layers in the definition of technology that were expressed earlier in this paper, we can also look at language as a technology. However, if we look at language in its most basic form, we also see that it is also a construction of society. It is constructed within a specific context to serve a particular purpose. It is within the specific context that language gives meaning to particular objects and behaviors. Language can be seen as a technology in that it facilitates human activity and also that it is made up of different components. The nature of language is to provide access to a community or the
knowledge base of culture. By providing access to the knowledge of a community or society, we are also placing language within a political and social landscape. Delpit's (1998) principles outline for the reader ways in which politics play out through language and how language through its linguistic codes serves to alienate and to hinder the success of those outside the linguistic culture in power.

In addition to the linguistic power, Delpit (1998) states that this power is played out in the classroom and through the tools used there. This is important to note because we intend to explore the implications this discussion of social interaction has upon the AAC device in the classroom.

If we consider the African American AAC user, we can assume that issues of power will also affect their ability to gain access to the community's knowledge base - that is, the knowledge base of the speaking community. The inability to speak limits the opportunity to interact and negotiate so as to construct the language needed, according to the literature on how language and knowledge are constructed. Delpit (1998) talks about the 'normal' child in a 'normal' classroom with 'normal' educational tools; yet, I add to this discussion the issue of power and language and how they further compound the barriers for children with verbal disabilities.

Given the previous argument, the AAC is not an overnight creation; like other technologies, it has been developed over years. The AAC device is made up of other technological devices. It is made up of a computer component, software, language and (English in the US) symbols all of which are socially constructed within a particular context. A technology in general is constructed socially and serves to shape the reality of its user; so also is the Augmentative communication device computer component. If
language is political and is socially constructed within a social context, which relies on social interaction, then the language represented on the AAC system should also be considered a construction of social interaction. If power is enacted in the classroom (Delpit 1995) for ‘normal’ children and their tools, then the same exists, for children who use AAC devices as their educational tools.

This implies that AAC devices and their users are not immune to the political, cultural, and social impact of the social construction of technology or language. This further implies that we need to make sure that the AAC users and developers are aware of the issues surrounding the nature of this technology of being highly political and economic in nature. Social construction, unlike social determinism, sees technology as an integral part of society that is developed within the society. We must, however, wonder if the AAC technology is developed within the users’ society or the social experience of the developers and then given as a tool.

Because this research is concerned with understanding the impact of AAC technology on expanding education opportunities for students’ with communication impairments in the classroom, it must account for how AAC is constructed and how it is comprehended in the schooling process. Thus, the theoretical framework for the study is informed by relationships between language (how language mediates communication and learning in the classroom) and technology (how technology mediates language for the nonverbal student), and critical social perspective on the effects of verbal disability on students’ participation in the classroom. Accordingly, in this section, I first present the interconnection of language, technology and the classroom. Next, I present some of Foucault’s ideas pertaining to language as power/knowledge in institutions such as
schools. After discussing this theory, I will describe Gramsci's theory of hegemony and normalcy, as both viewpoints will be at the forefront of the interpretation of my data. Finally, I will bring Delpit's concept of power enacted through language and the tools into the framework.

Language and technology in the classroom

The public school system assumes "normalcy" or standards in order to determine or assess students' cognitive and social abilities. In the context of the hegemonic language of schools, use of language other than Standard English is typically seen as a deficiency. The language structure produced by the AAC technology is different from the normal language structure of the classroom. Therefore, language diversity or differences must be accepted in order to accommodate or include the student with a verbal disability. Because public education assumes that a child enters school with an intact oral language system, the curriculum is designed according to these assumptions thus not much attention is given to the central role of the language in learning and this puts children with language disorders at a high risk of failing (Asha 1982). In addition, if teacher's assessment of knowledge or abilities correlates with the individual's language abilities, then, the student is also at risk of being taught less.

Language becomes a key factor of the success of students whose linguistic style is different from the "normal" linguistic style of the schools. Language must then become an integral part of the learning process; it is not simply an isolated skill but it is imperative to the academic and social development of the student (Asha 1982). It means
that language must be explicitly taught within the context of the academic area. Given the public education system’s assumption of language, it is inherently important for AAC users to be given explicit language and communication instructions. This is imperative given the premise that success in education depends on skills in communication.

As previously discussed, AAC technology has been introduced as a solution to the communication disorder of nonverbal individuals. However, its implementation and usage depends on many sociocultural factors. Not only do competing linguistic forms have to surpass the assumption of deficiency but the innovation of technology must also infiltrate the traditional perspectives of learning as well as the conflicts within the practice of using technology. Therefore, language, technology, and the culture of the classroom must converge to accept AAC as a legitimate linguistic strategy in order to accept fully and accommodate the AAC user. For this reason, many critical questions must be asked in order to determine what does and doesn’t work and why?

Mobilizing Foucault: discourse, knowledge/power

In order to understand better the complexity of the role of technology as a language mediation tool in the learning process for nonverbal students, a theoretical framework is needed. Foucault’s viewpoint is the first of the three theoretical frameworks I will employ for this exploration. Three aspects of Foucault’s work offer a theoretical framework that can help the analysis and interpretation so that we can understand better the experiences of nonverbal students using AAC devices (Weiner, et. Al). His first aspect is the use of discourse. Exploring the discourses that are associated with AAC technology and nonverbal students will help explain the ways of thinking
about AAC technology and the nonverbal students that are so deeply embedded in the practice of schooling that we are unconscious of their existence (Weiner et. al). The second aspect is Foucault understands of power–knowledge relations. As discussed in Weiner et. Al (1997) “there is no power relations without a correlative constitution of a field of knowledge (622).” This is important because it is central to the discourse of AAC technology and nonverbal students. Questions that need to be asked include who has shaped the discourse on AAC technology/equitable education? On what evidence and with what intent? (Wiener et. Al., 9997). The final aspect of Foucault’s work that is useful in the analysis of this study is the incorporation of the local. Thus, any discussion about the AAC users’ experiences “needs to address specificities of local, confined settings (622).” It must also be understood in relation to the dominant educational discourse of school children with disabilities and equitable educational opportunities. Foucault does not suggest that we simply attack the visible world of power, but the internal power relations that are imbued in knowledge and realized through language. On the surface, we are talking about the knowledge and power that has situated persons with disabilities into special education versus regular education. Then, we must also consider the impact of this knowledge and power on the individual’s ability to use her/his knowledge and language to acquire knowledge and language. Specifically what are the functions and limits of language for students using AAC technology?

Lemert & Gillian (1982) explain Foucault’s ideas on the functions and limits of language. They focus on existence, functioning and practice of language rather than on the essence or form of language. Foucault’s focus is on history, knowledge and power; however, his paradigm provides a framework for the exploration of language, knowledge
and power, which relies upon history for present understanding of self-sustaining power. Foucault develops a power-knowledge theory in which power is a general productive force as much as it is a negative repressive action. Foucault's work on power-knowledge provides a critical social theory point of view into questioning the social and political nature of language as it relates to AAC users in the classroom, particularly to differential treatment based on their status as people with disabilities and linguistic differences.

Gramsci and explicit teaching of the dominant language

For Gramsci (Forgacs & Nowell-Smith 1985), linguistic relations are not only representations and historical traces of past and present power relations but are also paradigms for other relations of cultural influences and prestige. This brings us to issues of knowledge and power associated with language differences of AAC users within the academic environment of the classroom (165).

Language and literacy have become a focus of continual debate in the process of school and culture. However, speech becomes a very important concept when considering the AAC user. Gramsci's concept of hegemony provides a framework for viewing the relationship between the AAC's speech and the dominant speech. Gramsci was influenced by the neolinguist who "described language change as a process in which a dominant speech community exerts prestige over the contiguous subordinate communities (Forgacs and Norwell-Smith 1985:164)." Some kinds of knowledge are given privileged status over other kinds of knowledge thus the knowledge of AAC users is stigmatized. In other words, education functions as a kind of legitimizing field over what kinds of knowledge matter most. It also functions as a gatekeeper as to who has
access to this knowledge. It is important to note that this research is interested in two types of knowledge. One, the knowledge that governs the practice of educating and schooling children with differences; and two, the knowledge that is made available to children with differences based on the social structures of these practices. The social process of education implies that learning takes place within a larger context (the society) that entails differential status for different classes, ethnic or cultural groups as well as purposes for schooling that reflect practices and goals of the dominant groups. This includes what is taught, how it is taught, how students are allowed to participate, and how students are expected to learn (Estrin 1993).

The educational system is structured around what is considered “normal”. Often children who are different fail or do not even participate in the “normal” education process. When educators believe that there is a standard or normal way of doing things, their belief places children inside and outside of the “norm” within a socio-political struggle. In light of Gramsci’s (Forgacs & Nowell-Smith 1985) discussion of ‘normative grammar’ in which he states “working class children are deprived if denied access to the more culturally advanced language that other students have access to”, AAC users should be considered as well. Gramsci (1985) was not advocating that children should be forced to change their way of speaking, but he believed that as a dominant standard language is established, they would naturally adopt it if exposed to it. However, normative or explicit teaching would speed up the process. The same can be seen as true
for AAC users. It may be possible that they will never be able to adopt fully the style of language and speech of the dominant verbal community; however, by including them in the normative language teaching of the classroom, it is possible that AAC users may learn to use the devices more appropriately. The inclusion does not simply mean placing them in regular classrooms, but they need to be able to take full advantage of learning opportunities in the classroom using their devices.

Delpit: Connecting the disadvantaged to equal education opportunities through explicit teaching of the dominant linguistic codes.

In the light of Gramsci’s (in Forgacs et. Al 1985) hegemonic language and Foucault’s power/knowledge relationship, I will use Delpit’s critical theory approach, modified, to explore AAC as a linguistic and speech style for nonverbal children in the classroom. Foucault’s framework on power/relations and Gramsci’s thoughts on hegemony set the stage for Delpit’s questions or themes which she labels as the ‘culture of power’. Delpit (1995) explains the socio-political struggle in terms of failure, due in part to the social and political nature of linguistic differences, particularly for children whose linguistic codes are different from the codes of power. The codes of power are explained as the rules and guidelines that are expected by the dominant culture of the society and school system. Like Gramsci, Delpit (1995) suggests, that children who are not familiar with the rules of the dominant culture of the classroom are generally considered to be at risk of failure or being denied access to dominant culture codes.

Delpit’s focus is on how education needs to be explicitly thought about as connecting disadvantaged students with the "culture of power." Delpit (1995) outlines five aspects of the situation.
1. Issues of power are enacted in classrooms.
2. There are codes or rules for participating in power; that is, there is a 'culture of power.'
3. The rules of the culture of power are a reflection of the rules of the culture of those who have power.
4. If you are not already a participant in the culture of power, being told explicitly the rules of that culture makes acquiring power easier.
5. Those with power are frequently least aware of - or least willing to acknowledge - its existence. Those with less power are often most aware of its existence (24).

Delpit (1995) is addressing concerns of students from ethnically diverse backgrounds and economically disadvantaged students. I seek to use her work to bring nonverbal students and their tools to the forefront of the debate of the 'culture of power'. Although she notes that the first three are basic tenets in the literature of the sociology of education and she focuses on the latter two, my primary focus for this study is premised on the first three.

The first point refers to relationships of authority and how each relationship serves to determine how, what and where a student learns. Delpit explains that the teacher has power over the student, and that the curriculum developers have power over what is taught. I interject that the designers of AAC devices have power over the students’ ability to communicate and learn because the structure of the device dictates its uses. Therefore it is not just the individual’s condition that dictates his situation but it is the innumerable social relations and ideologies that situate the student. Delpit (1995) states that the process of schooling, which is a juxtaposition of all the possible power relations, is intimately related to the power that determines the future economic and social state of an individual.
Delpit's second point suggests that there is a set of rules and codes that are required for the students to participate in the discourse. She particularly addresses the issue of communication, which includes linguistic, communicative strategies, ways of talking, and ways of interacting. The dominant culture's way of participating conflicts with that of the AAC user. The way in which the AAC user incorporates the dominant culture's codes and the way in which the dominant culture incorporates the AAC users' strategy will determine the way in which the student will be taught.

The third point states that the students' success is determined by how well they acquire the codes of the dominant culture. Thus, it is important for the AAC user to be given direct instruction in how to use their strategy within dominant culture situations. It cannot be assumed that simply teaching nonverbal students to use the device will enable them to use it effectively in dominant culture situations. They must be provided with situations that model the real life situations in which they will be placed.

Summary

This research seeks to explore the implications of implementing and using AAC technology within current schooling practices.

For the AAC users the problem is the inability to participate without intervention due to their limited ability to interact verbally and their different styles of communication. For children with verbal disabilities, the struggle is their ability to participate in regular classroom settings and gain control of the social power that dictates their position. Edwards (1991) states that social aspects of the use of technology are less predictable and tractable than the complex components that make up the technology.
Clearly, then, any full understanding of the impact that Augmentative Alternative Communication technology has on the classroom experience or its users must include knowledge of the social aspects in academic settings as they are designed to support students with disabilities and to redefine the purpose of the education process to produce a better life for the students. Moreover, any understanding of the AAC user's experience must be based on the knowledge of influences exerted by social construction and social interaction of the development of AAC technology and AAC user.

Although studies in Augmentative Communication do not address this topic directly, intersections of research in language and technology in relation to AAC in the classroom overlap and provide an important theoretical foundation. This study takes on an interdisciplinary approach using social-cultural-linguistic, social interaction, and social construction, as well as critical social theory.

Augmentative Alternative Communication has been introduced as a solution to the problems of nonverbal students. As AAC is incorporated into the classroom, all involved must gain a better understanding of purpose and power of language and technology as it relates to AAC users.

If we believe that technology has been shaped by social interactions and, in turn, it has the power to shape our social interactions and our social interactions are centered around our language and our language is shaped by culture and the ability to interact with others, then understanding the experiences of non-speaking students in the classroom hinges on understanding the impact of both language and technology in the construction of the verbally disabled AAC user. Furthermore, if AAC technology is to be a means to facilitate verbally disabled students' interaction, then, the current classroom practices
must be examined as they relate to language, technology, and verbal disability as well as explore power relations that construct the experience of the nonverbal student.

Therefore, it is my assumption that computer technology, language, verbal disability as well as the classroom practices are factors for understanding the use of AAC technology in the education of nonverbal students.
CHAPTER 3

METHODS OF EXPLORATION

Introduction

This study was concerned with understanding the implementation and usage of AAC technology in the classroom. It must account for how AAC is constructed and how it is apprehended in the schooling process. Thus, the theoretical framework for the study is informed by relationships between language (how language mediates communication and learning in the classroom) and technology (how technology mediates language for the nonverbal student), and critical social perspective on the effects of verbal disability on the student's participation in the classroom. As discussed in the previous chapter, social construction assumptions as well as Foucault's ideas pertaining to language power/knowledge in institutions such as schools, Gramsci's theory of hegemony and normalcy are both at the forefront of the interpretation of my data, Delpit's concepts of power enacted in the classroom provided the framework for both inquiry and data analysis.

The underlying assumption of this study was that language is constructed within a socio-cultural context and that it is realized through verbal interactions (Trueba 1989, Dyson 1992, Jaggar & Burke 1985). Language development literature presents language as being socially constructed. This construction was premised on the ability to speak.
It is said that children develop language skills within their verbal interactions. It is assumed that their level of verbal ability corresponds with their cognitive abilities and thus impacts the way they participate in the schooling process.

Within this study, there are some that believe that those in the classroom are not consistently being considered when these technologies are being developed. Therefore, the social environment of the classroom and the teacher's reality was not for the most part compatible with the integration of technology. It appeared that educational technology, specifically the computer, was off in a corner many times waiting for recess or someone to finish early. With this in mind how do social environment and the social construction of language shape the impact of computers on the inclusion of a child with a disability that requires technical intervention in order for that child to be included?

If language is socially constructed and it is the primary mediation tool for learning in the class, then, for all children to have equitable access to the knowledge that is gained in the classroom, they must be fundamentally prepared and equipped with the proper tools. From infancy, most children begin to develop the language tool. However, there are some children who biologically lack this tool and must be provided with some alternative to the natural language tools. Unfortunately, children who have disabilities are seen as having a deficit. This deficit traditionally is framed by the medical model in which the disability is generally seen as the cause of social and educational isolation and inequity. Competing with the deficit or medical model is the social model. This model is largely indebted to the works of Vygotksy (1932/1962) when considering special
education. The social model places subjectivity on the environment and the social and political structures of that environment. Together these points to the working hypothesis elaborated in table 3.1.

**AAC Working Hypothesis**

If AAC users' participation depends on their ability to socially interact and
Their ability to socially interact depends on their ability to communicate and
Their ability to communicate is dependent on the language they have available to them and
Their language is dependent on what is provided or taught them and
What is taught is dependent on their cognitive ability and
Their cognitive ability is measured by their verbal ability

*Then, it is important to fully understand or explore ways to improve their verbal ability or to supplement it.*

If AAC can supplement verbal ability, then, we should be able to assume that nonverbal students using AAC would have a more positive educational experience.

However, something else occurs as well. AAC embodies the values, thoughts and processes of those who have designed it and those who program it.

It is constrained by the practices, which it is expected to transcend.

*Then, it is also important to explore and understand these practices and their impact on nonverbal AAC users.*

Table 3.1 Working Hypotheses
Research Design and Methods

The study was designed as a multi-site case study (Marshall and Rossman 1999) in order to understand the functions and the limits of AAC technology in the social setting where AAC users are expected to participate. I had originally wanted to study nonverbal students in regular classrooms whose only disability was the inability to speak. Through a pilot study in which I was a participant observer at a Communication Camp, I learned that it is rare to find students with verbal impairments that don't have other disabilities as well. I also learned that there are very few nonverbal students in regular classrooms and few AAC users at the elementary level. Although the purpose of inquiry remained the same, changes in site and population were made. Also, observations were not just conducted in the formal classroom setting. The research included observation in the extended classroom because learning occurred in the community as well as in the classroom for some of the students.

Setting

The inclusion process in this central Illinois district is individualized based on the student's needs and where the IEP team decides those needs can best be met. The district has not set any specific guidelines as to the process of including students with special needs in the general education classroom environment. The placement is determined by the special education teacher and is agreed upon by the general education teacher. In the cases observed these arrangements are made after the school year has begun. However, general education teachers have the option to say "No". Joy informs me that in most cases teachers do not say "No" because the special education teacher goes to those
teachers with whom they have built a relationship. Although the district does not subscribe to full inclusion, they do believe that the students should be educated in the same schools. In fact the Director of special education informed me that towards the end of the '80's and early '90's special needs students were educated in a separate facility from their able-bodied peers. However, the Office of Civil Rights cited the district along with nine others in Illinois as being in violation of the IDEA, stating that the school did not provide opportunity for disabled students to be educated in Least Restricted Environment with their able-bodied peers. The school was a cooperative effort between the two school districts. The two districts were required to show how the school did in fact provide opportunity for the students to be educated with their able-bodied peers if they could not do so, then, they would have to close down the school. The two districts meet and decided to break up the school and reintroduce the special needs students to the public school system.

Subject

Seven participants (One Mexican female, One Nigerian male and five white males) who used AAC in the classroom (two elementary, three Junior high, and two high school) were selected to participate in the study.
### Table 3.2 Demographics of students observed

Participants were recommended by the speech pathologist in their school district in Central Illinois. Recommended AAC using students were invited to participate in the study. All participants were contacted by the speech pathologist and permissions were obtained by the speech pathologist. The purpose and requirements of the study were explained in writing to parents and teachers. Formal verbal explanations were presented to the teachers upon request. Students were asked for consent by their parents. Parents know their children and will know best their wishes. Students who consented to participate were asked to sign or use appropriate name stamps in the presence of a witness and their parents.
Purposeful sampling or theoretical sampling was used instead of random sampling which is more characteristic of quantitative research (Patton 1990). According to Patton, there are at least 16 types of purposeful sampling. I used a combination with criterion sampling being my primary method. Thus, students for this study were selected by the speech pathologist, based on the criterion and explanation that I provided for the study.

Initially the primary criterions were that the student had to be elementary, nonverbal, use AAC device, and included in regular classroom. Due to the low number of students that meet all criteria some changes were made. I had to use a sample of students that met the major criterion, and those students that were convenient. So I altered the criterion to include all grade levels and all classroom types. However, all other criteria remained the same.

This was important because verbal ability is a consistent theme throughout language development literature that states that verbal ability is necessary for language construction to occur. The premise is that those students who are low in verbal ability have minimum language development or communication competency. Light (1989) states that “communication competency is the ability to communicate within the natural environment and to adequately meet daily communication needs. It has been suggested that this ability is premised on the integration of knowledge judgment and the skills in four areas: linguistic and operational competencies refer to knowledge and skills in the use of the tools of communication; social and strategic competence reflects functional knowledge and judgment interaction (142-143).” This was important when looking at the nature of my questions to understand the impact of using technology as a supplement for
natural language ability. To ensure anonymity of subjects, pseudonyms were constructed. Tables two and three provide pseudonyms and information for professionals and students involved in the study.

<table>
<thead>
<tr>
<th>Staff</th>
<th>Position</th>
<th>Grade</th>
<th>Type of classroom</th>
<th>Type of contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joy</td>
<td>Speech pathologist</td>
<td>All grade levels</td>
<td>EMD/TMD</td>
<td>Interview, observation, main contact person</td>
</tr>
<tr>
<td>Eboni</td>
<td>Speech pathologist</td>
<td>Elementary</td>
<td>EMD</td>
<td>Observation/informal discussions/assist in programming device</td>
</tr>
<tr>
<td>Michelle</td>
<td>Teacher</td>
<td>Elementary</td>
<td>EMD/TMD</td>
<td>Observation/questionnaire</td>
</tr>
<tr>
<td>Stacey</td>
<td>Teacher</td>
<td>Elementary</td>
<td>EMD</td>
<td>Observation</td>
</tr>
<tr>
<td>Safi</td>
<td>Teacher</td>
<td>Elementary</td>
<td>Regular</td>
<td>Observation</td>
</tr>
<tr>
<td>Stephanie</td>
<td>Teacher</td>
<td>Middle</td>
<td>TMD</td>
<td>Observation/Interview</td>
</tr>
<tr>
<td>Carol</td>
<td>Teacher</td>
<td>High school</td>
<td>TMD</td>
<td>Observation/Interview</td>
</tr>
</tbody>
</table>

Table 3.3 Staff information with pseudonyms

<table>
<thead>
<tr>
<th>Student</th>
<th>Grade level</th>
<th>Device</th>
<th>Where observed</th>
<th>Disability</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>Type of placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor</td>
<td>Elemen.</td>
<td>Mccaw</td>
<td>Spec. Ed. Room/ mainstream</td>
<td>Multiple</td>
<td>Male</td>
<td>White</td>
<td>EMD</td>
</tr>
<tr>
<td>Maya</td>
<td>Elemen.</td>
<td>Mccaw</td>
<td>Spec. Ed/fine arts</td>
<td>Down syndrome</td>
<td>Female</td>
<td>Mexican</td>
<td>EMD</td>
</tr>
<tr>
<td>Kai</td>
<td>Middle</td>
<td>Dynovox</td>
<td>Spec. Ed</td>
<td>Sickle cell</td>
<td>Male</td>
<td>Nigerian</td>
<td>TMD</td>
</tr>
<tr>
<td>Danelle</td>
<td>Middle</td>
<td>Dynovox</td>
<td>Spec. Ed</td>
<td>Down Syndrome</td>
<td>Male</td>
<td>White</td>
<td>TMD</td>
</tr>
<tr>
<td>Tyler</td>
<td>Middle</td>
<td>Dynovox</td>
<td>Spec. Ed</td>
<td>Down Syndrome</td>
<td>Male</td>
<td>White</td>
<td>TMD</td>
</tr>
<tr>
<td>Brian</td>
<td>High</td>
<td>Dynovox</td>
<td>Spec. Ed</td>
<td>Autism</td>
<td>Male</td>
<td>White</td>
<td>TMD</td>
</tr>
</tbody>
</table>

Table 3.4 Student information with pseudonyms
Data Collection

This section discusses the strategies that were used in order to collect and manage data. I used an ethnographic approach, which incorporated interviews, observations, videotaping, audiotaping, and collective interpretation and analysis through member checks. The study’s focus is on language and communication. Marshall and Rossman (1999) state that this genre typically involves microanalysis through which speech events and subtle interactions are recorded (often through videotape) and then analyzed.

Interview

Interviews were used as one of the data collection tools. Interviews served the purpose of understanding the professionals’ perspective on the AAC user and the device. They also provided a means for obtaining background information as well as for a better understanding of the barriers presented by the disability and the devices.

Although the interviews were unstructured the initial guiding questions were generated from the underling assumptions of the study. Although the professionals answered questions while I was observing and were willing to clarify things as we went along, I still conducted formal unstructured interviews and administered a written survey. In many cases, information was given to me without my requesting it, which opened up opportunities for me to find out other pertinent information. I interviewed teachers and speech pathologists (informally and formally, written and oral). I also collected nonverbal demographic data from the speech pathologists and the background information concerning special needs students in the public school system.
I conducted informal and formal interviews with two teachers and one speech pathologist. In addition, I offered three other teachers the option of a written questionnaire or oral interview. Two were returned to me by mail, one of which was not completed, but included a note in which the teacher declined to complete the questionnaire on the basis she did not know enough about the device. The third teacher did not return her questionnaire at all. Two copies were given to this teacher. This particular teacher also agreed to give formal interview, but never made herself available. In addition, I had informal conversations with teaching assistants and another speech pathologist. Informal interviews are presented in the form of field notes and formal interviews are denoted as interviews.

Observation

The focus of the observations was to explore the uses of AAC devices during instruction. Over a four-month period, I observed classes at an elementary, middle and high school. During each visit, I spent a minimum of three hours each visit.

I observed seven nonverbal students who used AAC devices in their classrooms, two Trainable Mental Development (TMD) high school students, three TMD middle school students and two Educable Mental Development (EMD) elementary school students.

At the high school, I observed two male TMD students over a period of a month in different activities in and out of the classroom (See appendix for a complete list of activities). My original intent was to restrict my observation to the classroom, but I made a shift because the students' learning environment was not limited to the classroom. I
observed the students in the community at the post office and at Target. I observed them in the classroom on four different occasions, including working on a “goodbye lesson” with student intern. This was a lesson presented by the intern on her last day. The subject of her lesson was “goodbye”. The object was to teach how to say “goodbye”. I also observed students working on an assignment during the vocational occupation time in which they did some work for different agencies including the library. I observed them twice during classroom time as they worked with their regular education teacher on weekend sheets. The students and their parents, detailing what they did over the weekend filled out weekend sheets (See appendix E). At the beginning of each week, the students shared what they did with their classmates. This was to encourage communication and to improve communication skills. Students are encouraged to ask each other question.

At the middle school, I observed three male students who used AAC devices for communication and learning. Once again, these students were part of the TMD program. I observed the three students during math, reading, community preparation, weekend sheets, and speech therapy.

At the elementary school, I observed two students, one male and one Mexican female. At the elementary school the students were in EMD classrooms. These students were in academic classrooms instead of training programs. At the elementary school, the students were in different classrooms. The male student had physical disabilities in addition to verbal disabilities. He had minimal motor skills and did not walk. I observed him in his special education classroom, with a speech pathologist, and in his mainstream classroom. I observed the female student in her special education classroom, music and gym. Because my initial intent was the elementary students and the inclusion of these
students, I did follow up observation on Taylor the following school year. Some of the observations were videotaped and for others I observed and took notes once I left the site. I made this decision in situations where I believed that the teachers or students were not comfortable with the camera.

Time Line

My pattern when conducting the observation portion of the study was to spend time observing different academic activities. The speech pathologist was the one who selected the best times and initially made arrangements with the teachers. I made a minimum of four visits during the 1999-2000 school year at the beginning of the 2000-2001 school year I returned to follow up on one student who was mainstreamed. Interviews were conducted intermittently. Table 3.5 provides a chronological list of events.
<table>
<thead>
<tr>
<th>Date</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb</td>
<td>Contacted Professor at ISU for information on possible sites or persons to contact. Referred to two speech pathologists.</td>
</tr>
<tr>
<td>Feb</td>
<td>Contacted the first speech pathologist. Made arrangements to discuss my research.</td>
</tr>
<tr>
<td>Feb</td>
<td>Meeting was cancelled. Speech pathologist didn’t think she had what I needed.</td>
</tr>
<tr>
<td>March</td>
<td>Contacted second referral. Set up meeting.</td>
</tr>
<tr>
<td>March</td>
<td>Met with speech pathologist. Showed me around site and made introductions.</td>
</tr>
<tr>
<td>March</td>
<td>Submitted human subjects applications.</td>
</tr>
<tr>
<td>April</td>
<td>Conditionally accepted.</td>
</tr>
<tr>
<td>April</td>
<td>Submitted conditions.</td>
</tr>
<tr>
<td>April</td>
<td>Provided contact with permission forms for teachers and parents.</td>
</tr>
<tr>
<td>May</td>
<td>Began observing students who returned permission forms.</td>
</tr>
<tr>
<td>May</td>
<td>All student permission forms were returned to speech pathologist</td>
</tr>
<tr>
<td>May</td>
<td>Observed at all three schools.</td>
</tr>
<tr>
<td>May-June</td>
<td>Interviewed speech pathologist and teachers</td>
</tr>
<tr>
<td>June</td>
<td>Gave other teachers written survey</td>
</tr>
<tr>
<td>June-July</td>
<td>Received written survey</td>
</tr>
<tr>
<td>June-August</td>
<td>Transcribed interviews.</td>
</tr>
<tr>
<td>September</td>
<td>Emailed transcriptions to interviewees for approval or comments</td>
</tr>
<tr>
<td>September</td>
<td>Observed at elementary school</td>
</tr>
<tr>
<td>September</td>
<td>Participated in training to prepare overlays (see appendix)</td>
</tr>
<tr>
<td>September</td>
<td>Working with second speech pathologist to prepare overlays</td>
</tr>
<tr>
<td>September</td>
<td>Withdrew from the classroom</td>
</tr>
<tr>
<td>September</td>
<td>Completed observations</td>
</tr>
<tr>
<td>October</td>
<td>Requested demographic information from speech pathologist</td>
</tr>
<tr>
<td>October-December</td>
<td>Writing</td>
</tr>
<tr>
<td>November</td>
<td>Submitted 1st draft to advisor</td>
</tr>
<tr>
<td>December</td>
<td>Discussed chapter 3 and revisions</td>
</tr>
<tr>
<td>December</td>
<td>Writing revisions / and starting other chapters</td>
</tr>
</tbody>
</table>

Table 3.5 Timeline
Analysis of Data

Observational and interview data were analyzed through a process of inductive analysis (Huberman and Miles, 1994) which included a microanalysis in which speech events and subtle interactions were recorded through videotape and then analyzed (Marshall, and Rossman, 1999). During this process, I used data displays and charts to help in the conceptual organization of the emerging themes as well as a method of data reduction. I used a combination of participant and analyst constructed typologies as well as themes that were assumed in the underlying theoretical perspectives that framed the study. These charts helped when I was drawing conclusions and theorizing and were employed throughout the study (Glesne & Peshkin 1992).

Data collection generated three types of data: videotape, audiotape and field notes. I chose to use a color-coding system to manage the audio data, which were from the interviews conducted with the professionals. I stored transcribed information in computer files and coded them by themes using Microsoft word. I then sorted the data based on the codes and made new files. Each new file was linked to its original context in the original document by hyperlinks. Using the emerging themes and data displays I constructed summaries.

I also transcribed the observations and used them as support or as negative examples of summaries. Data collection and analysis were an ongoing process throughout the study. Video was viewed for relevant segments. Not all were transcribed. Video was marked for segments that would be used and those segments transcribed. Field notes were transcribed and compared with video segments.
Soundness of Design

To ensure the credibility of both the data collected and the interpretations two techniques - triangulation and member check - were incorporated into the design of the study. Triangulation is the process by which multiple methods are used to secure an in-depth understanding of a phenomenon (Denzin and Lincoln, 1994). As discussed earlier multiple sources and methods of data collection were used. Not only does triangulation provide credibility but it also strengthens the case of the study for transferability (Marshall and Rossman, 1999).

To further ensure trustworthiness of the findings of the study, teachers and speech pathologists were given opportunities to check data transcripts as well as the findings for accuracy. This allowed the data findings to be confirmed by someone other than the researcher (Lincoln and Guba). This is what Denzin and Lincoln (1994) refer to as "member checking". Member checks provided feedback from participants that the data and interpretations are reliable.

Limitations of the Study

Transferability of the findings of the present study was considered in terms of the following limitations:

This research is limited in that its main focus is on verbal disability, specifically limited to those students who use Augmentative Alternative Communication high technology. However, verbal disability is usually the result of some other disability or injury. For example each of the students who are participating in this study has other

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disabling conditions, which have caused the inability or limited ability to communicate verbally. Among these conditions are autism, Down’s syndrome, sickle cell, and multiple disabilities. All of these in most cases cause the student to be limited in verbal abilities.

Primary limitations of the study included the absence of the students’ voices in the qualitative data. Due to my interpretation of the teacher’s perceptions of the students’ ability to understand, I felt uncomfortable and unsure how to interview them. On occasions, I talked with the students but did not feel comfortable in asking more complex questions. In retrospect, I somehow linked their knowledge to their language abilities. I actually denied them an opportunity to be heard because I transferred my inability to understand as their inability to understand as those who denied them access.

The mainstream teacher’s input was also absent. The reason is that the mainstream teacher withdrew from the interview process of data collection, stating that she did not know enough about the technology to be able to answer questions relating to it. The second mainstream teacher was not selected by the time I left the site.

Observations were prematurely ended due to the discomfort of one special education teacher. She no longer felt comfortable with me being in her classroom and this was obvious from her attitude and that of her teaching assistant towards me.

High technology is one of many varieties of solutions to assist people with verbal disorders to meet their daily communication needs. This research is also limited in the fact that there are few children with high technology AAC devices placed in regular education classrooms.
Due to the limited number of non-verbal AAC high technology users who participated in the study, the results of data analysis may limit generalization to similar populations. Sampling was limited to the population that is available to the researcher. Ideally, the sample would include a diverse group of students in terms of ethnicity, gender, age, and abilities.

The data collection methods selected for this study have their strengths and are relevant for the type of study employed. However, the participants’ observations and interview methods are not without some limitations. Both are open to multiple interpretations and are dependent on key individuals’ cooperation and participants’ openness and honesty. It was also dependent upon the researcher’s ability to be resourceful, systematic, and honest. (Marshall & Rosman, 1999)

Videotaping was also part of the data collection process and poses some limitations in the form of the researcher excluding information by deciding what to focus the camera on. Videotape poses a problem of transcribing.

The study took place over a four-month period, and thus yielded data, which were related only to the current practices. Previous practices in the district studied, as well as future policy shifts could possibly alter applicability of these data in other settings.

Transferability is limited to situations where the population is homogeneous. However, it can be used as a framework to question why certain processes are being used.
Summary

This chapter has presented a working hypothesis, and described the study's design, methods, and limitations.

In public education, nonverbal students' academic experience is contingent upon the outcome of struggle over linguistic styles of the speaking community in contrast with that of the nonverbal student. The acceptance of AAC as a legitimate communication mediation and learning tool and understanding the relationship between current practices and policy used in educating students with disabilities and new technologies.

It is traceable in this study that if we believe that technology has been shaped by social interaction and in turn it has the power to shape our social interactions and our social interactions are centered around our language and our language is itself shaped by culture and the ability to interact with others, then, understanding the impact of AAC technology in the educational experiences of nonverbal students in the classroom hinges on understanding the impact of both language, and technology as in relationship to the teachers assumption of communication and implementation of technology in the classroom. Furthermore, if AAC technology is to be a means to facilitate verbally disabled students' interaction, then, the current classroom norms must be examined as they relate to language and technology as well as the knowledge and power that govern these factors. Otherwise, the system, which is intended to educate the student, may very well be disabled itself.
CHAPTER 4

THE SOCIAL CONTEXT SHAPING TECHNOLOGY USAGE IN THE CLASSROOM

Introduction

The purpose of this study was to explore the application of AAC technology in the classroom. The intent was to better understand better the impact AAC has on the opening up more equitable educational opportunities. At the onset of the study it was my assumption (see table 3.1) that nonverbal students social interaction and academic learning would improve if provided with the ability to verbalize. However, the linguistic structure of AAC is different from that of the dominant speaking culture. It is this difference, which is an important factor in the construction of the nonverbal students as "other", placing them in a marginalized educational situation (special education). It was further assumed, as presented in table 2.1, that if adaptations were made to fix the problem, then, the student would more likely be able to participate more fully in the dominant speaking culture. However, the findings of this study reveal that AAC has only the potential to facilitate the inclusion of nonverbal students and that the social factor of the environment impacts the potential of the AAC technology. For this reason the data suggest that the social factors associated with the implementation of AAC technology can function as a disabling force in the usage of the technology.
The way the authority figures approach the education practices for the AAC users determines the AAC potential and the student usage of the device. In this chapter, I suggest an informal philosophy that allows for the current professionals approach to the implementation and inclusion of the device and students, which in turn create possible barriers to the effectiveness of AAC technology.

The informal philosophy impacts both the use of AAC devices and the inclusion of the student in the classroom. It also impacts the social interaction and academic status. The goal of the AAC is to improve the communication competency of students who are limited in their verbal abilities. This chapter looked at the social barriers to inclusion, social interaction and academic growth.

Informal Philosophy

The statements and actions of the teachers and speech pathologist indicate that there is an informal philosophy of inclusion that is realized through the current practices in this district. It is visible that inclusion is subjective to the beliefs of those in the local setting. The data suggest the primary goal of the AAC device was to simply improve the communication competency of the student. It was never stated within formal or informal interviews nor shown in observations that the goal of the device was to improve the inclusion efforts nor the academic status of the nonverbal student. This was derived from statements made by those interviewed.

"Now there are school districts that you can go to and they will say we integrate all of our severe to moderate students and that is just their philosophy and they do it. This is not our philosophy we do not have that as a district philosophy (Stephanie, Interview 5/29/011)."

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"I don’t see what the benefit is to take a kid in the back of a room to work on his math (Carol, Interview 5/29/01).

***

“When we integrate kids it is based on that is what the parents want, we are not, our philosophy is not a full inclusion philosophy (Stephanie, Interview 5/29/01).”

***

The interview data support that it was the teacher’s understanding that no official directives from the administration were delineated with regard to the inclusion of special education students in the classroom. The following statement by one of the teachers interviewed indicates this.

We have had teachers say no and the building policy on that is why would you want to go into that class if the teacher really don’t want them in there. We don’t get a lot of direction from upper administration as far as saying. But when I worked in Arizona teachers were not hired unless they understood they would probably have a person with disability in their class. And realizing they have a responsibility and realizing they have no option (Stephanie, Interview 5/29/01).

This informal philosophy that grants the teacher the flexibility to decide on the usage of the technology impacts on the inclusion of students’ with verbal impairments. Consequently only one student was participating in the general education classroom, however it was the parent, not the teachers nor the speech pathologist, who requested this placement.

To further illustrate that inclusion is not a priority in the district is the teacher’s decision when to include the student. It appears that the placement was determined by the special education teacher and is agreed upon by the general education teacher. In the
case I observed, the arrangements were made after the school year had begun. It was my observation that it would take an outside force to shake the system. In this case it was my consistent questions about when Taylor would be placed in the mainstream classroom so that I could observe. For instance,

About a month after school had begun I was working on updating Taylor’s device so that I could observe him using it in the classroom. On this particular day Taylor’s teacher stopped me in the hallway of the school. She wanted to know how much longer I would be observing in her class. I informed her that I was waiting for the opportunity to observe Taylor in his mainstream classroom. I was interested in seeing how he used the device in the general education classroom. She was beginning to feel uncomfortable with me in her room and was looking for other options for me to observe Taylor. She asked me when I wanted to observe Taylor in the general education classroom. I paused for a minute; I couldn’t believe I was being given the option of setting a date for Taylor to enter the classroom. I asked whether he had been assigned to a teacher. He hadn’t been assigned yet but she would go and talk with the teacher if I knew when I would have the device ready. (Field notes 10/22/01)

This illustration is an example of the practice of placing students. There were no published or publicly available guidelines or timeframe for the implementation of AAC technology. This was verified in a phone conversation with the Director of special education.

On January 10, 2002, I phone the director to request background information about how special education in the district evolved. I was particularly interested from the time special needs students moved from a segregated school to integrated school. During the discussion I asked if there were any district policies for using AAC technology. I was informed that there are general approved policies and procedures, which include Assistive technology. I also requested demographic information on the number of nonverbal students in the district and the number of students using devices. He told me that the district does not have that type of information available. I actually received the demographic information in this study from Joy (Field notes 01/10/02).
Absence of specific guidelines is reiterated in statements by those professionals interviewed. It is left to the individual teachers of the school. The inclusion process in this central Illinois district is individualized, based on the student’s needs and where those needs can best be met. The district has not set any specific guidelines as to the process of including students with special needs in the general education classroom environment. Janey, Snell, Beers, and Raynes (1995) conducted a study to obtain information about inclusion. One item that was considered important to success was about not wanting specific guidelines. They were considered to be a hindrance to the flexibility in inclusionary setting (Janney et al. 1995, Turner 1996). However, Rsenholtz (1989) contends that in order for schools to meet the needs of a wide range of students teachers can not do whatever they define personally as effective teaching and operate in isolation.

It is noticeable that this flexibility is like a double-edged sword. On the one side, it can benefit the student, but on the other side, it can hinder efforts to improve performance. For instance, if the teachers are not interested in the AAC technology, then, the student who uses it will still have problems accessing the classroom curriculum and participating fully in the classroom language because the teachers’ agenda does not foster the use of the devices. The data suggest that the use of the devices reflects the way in which the devices are implemented in the classroom. For example, Teachers are not required to accept special education students. In most cases, they don’t say “No” because the special education teacher only goes to those teachers with whom they have a positive
relationship. Joy believes that it is in the best interest of the student when the teacher
takes the time to build a relationship with the general education teacher and gradually
moves the student into the general classroom. This tells me that inclusion is not a priority
within the special education program.

The informal philosophy, which gives the individual school and teacher the flexibility
to interpret and decide on the actions of the student, creates inconsistencies that lead to
conflict in the inclusion practices and academic growth of the nonverbal student. The
general education system is not left open to such flexibility. Standards are being set and
revised every year. Benchmarks are set as a guideline. Proficiency tests require teachers
and schools to be more accountable; yet, the special education system is flexible and lets
the teacher have full control. This type of flexibility leads to the perpetuation of unequal
educational opportunities for the student. Disabling environments cripple the AAC
potential for nonverbal students. For example,

During one of my observations I was sitting waiting for the students to
come into the classroom. Taylor was already in the room sitting and
waiting. When all of the students arrived the teacher announced that it
was one of the other students birthday and everyone was to make a
birthday card. Every student except Taylor was allowed to do this
activity. The TA continued to work with Taylor on putting together his
schedule for the day. Realizing that Taylor was not being allowed to
participate in the same activity of his classroom mates I asked the TA if
Jeremy would like to make a card as well. The TA responded by telling
me that he was not with it today. The teacher did not make any comments
are suggestions during this activity. In fact the teacher had very limited
interaction with the student (Observation field notes, 09/19/01)

This illustration demonstrates the inequity and unequal opportunities that exist for
Taylor compared to his verbal peers. Taylor does not get the same attention that the other
students receive from the teacher. Taylor main interaction is with the TA who told me
himself that he did not receive any training on how to work with Taylor to facilitate the usage of the AAC device (field notes 09/20/01). Making a card does not seem like a significant activity in the scheme of academic, but I use this illustration to demonstrate how Taylor’s limitation exclude him from the simplest activities when those in charge do not make efforts to include him. Although this is a special education classroom it is inclusive due to the fact that it has a variety of abilities in the classroom, i.e. readers, nonreaders, verbal, nonverbal, down syndrome, and learning disabilities just to name a few. The classroom is inclusive yet it is exclusive at the same time. Even in a restrictive environment, nonverbal students are at risk of being excluded especially when those that they depend on do not embrace the tools that is expected to mediated the learning and social process in the classroom.

AAC is not a given in the district. It depends on the interest and the knowledge of the teachers. This places much power in the hands of the individual professional. Delpit (1995) indicates that power is enacted in the classroom through the actions of the teacher and the materials used. The decision makers in the classroom have the power to construct the reality for the student. This is echoed in statements made by those who believe in the potential of AAC. Many barriers are present in the social environment of the classroom. In addition to the structure of the district, which I discussed above, barriers are found in the structure, routines, and teaching practices of the classroom.

Legislation, policies and programs exist which set guidelines and protocol for addressing and serving the needs of students with special needs. Yet, the lack of policy within the local district leaves general policy interpretation to the individual teacher. This practice leads to inconsistencies that impact the social and academic application of
AAC technology. In the next section, I present the social factors that reduce the impact AAC has on improving the communication competency of the students, which affects the students' ability to further develop a linguistic system that will allow them to participate more fully in the dominant linguistic culture of the school and society.

Impact of communication

"I have found that so many kids have a language base in their heads. So many kids have recognition of these words; so many kids have an understanding of things they heard that all they are lacking is speech. And all I have to give them is something that helps them use that ‘quote’ speech and they are able to use the language which is still in their heads.” (Joy, Interview 5/23/01)

When I asked how the device could facilitate language development and the speech act, I was told that in language development process, speech might not further develop but language does not necessarily stop. The device simply gives the student speech. The language is in the child’s head.

Joy made it clear that in the language development process, speech might not further develop but language doesn’t necessarily stop. Verbal articulation may stop.

Language is a social and cultural phenomenon that impacts the student’s participation and learning in school. Language provides the meanings and the words, as well as symbols that are used in the communication process. The following statement illustrates the social and cultural influence of language.

I try very hard with D (this verbal student) Like yesterday I was having a conversation with him because I wasn’t able to understand what he was saying. He was using the word FIXIN and I told him a word I used and I totally understand the cultural background of the word FIXIN and I didn’t get it. It sounded like said fitin.
I said what are you saying you are fitin what. Then we had this discussion that that was a part of his language that I didn’t have. So we talked about the differences (Carol, Interview 05/29/01)

The literature review in chapter 2 indicates that language is learned prior to verbal articulation but it is that verbal articulation that opens the child up for social interaction; thus ensuring a high language development. The language that is in children’s heads is that of their mother’s tongue or that which is spoken at home. At home, the families have developed their own communication systems that might not necessarily rely on the language strategies or linguistic culture of the school. Awareness of the different languages that students come to school with has been acknowledged as one of the weaknesses, actually, students who come to school with a language base that is not the same as that of the school are seen as having a deficit.

I am going to tell you a lot of the kids that I had 5-12 in Arizona sometimes the kids I don’t think had a handle on either one of the languages well, because from the time they are in early childhood they are subjected to English language and so you are looking at kids who are three years old and they are hearing English during school and Spanish at home of the home in Arizona are bilingual (Stephanie, Interview 05/29/01).

This is what Delpit (1995) refer to when she discusses the importance of the student being able to communicate and talk in ways that are appropriate for the social environment in which the student is to interact.

The English is the predetermined language for students in the U.S. public school system, the approach to this is determined by the speech pathologist and the team. The home language is not factored in because it is not the language used at school and the teachers are not familiar with the various cultural and linguistic structures that are represented.
If I had a cultural language here and I knew. See my problem is I don’t know a lot of cultures (Joy, Interview 05/23/01)

When I asked about cultural language I was told that the students should have access to the things children in their age groups say. Joy (interview 05/23/01) explains that she is not aware of any other cultural language. She does not know any other languages. If she knew that Latino said blah blah blah, then, she would put it on the device. Outside what she knows, Maya is the only child with a different language base. She would also have gender appropriate voices. However, getting gender appropriate voices sometimes takes too long.

Joy, the speech pathologist, says that students should have age appropriate language and if she had a cultural language here that she knew then she would use that as well. “Culturally outside of whom I normally have, Maya is Hispanic. She also had Kai who was African but whose parents are multilingual, English being one language they speak. Many times, English is selected because it is the dominant language in the settings in which the student will be interacting.

English is the base language used for all the devices in the district. Anything other than English is considered a deficit in the public school system. The language that is represented on the AAC device is structurally different from that of the verbal child. See (appendix C and G) this data shows a representation of the types of sentence structures and the iconic language that is employed by the technology. The linguistic structure of the AAC device will need to be functional, not necessarily grammatically correct. The goal of language is for the student to be able to communicate effectively. Those in the verbal community must be taught the various functions of language and when to use the language. These skills must be taught.
Think about when you go to a funeral. I remember going to a funeral and not knowing what to say. You have to teach people what to say. I still hate going to funerals because I am not quite sure what I should say (Joy, Interview 05/23/01).

The functional uses of language must be taught in general and specifically for AAC users. They must be explicitly taught how to use the language that they have available to them for meaningful communication. Joy further explains that there are big chunks of social language that somehow are missing. Some of the children are very sociable and that is based on how the family interact with them at home.

Communication plays a vital part in our everyday lives. Its impact on the quality of life is invisible until one has to deal with a disability that impairs the spontaneous flow of interaction with others. The difficulty of communicating with others may manifest itself in inappropriate behaviors such as biting.

Poor behavior, fundamentally, is communication. It is telling the person that something is wrong. It is necessary to teach an acceptable way to communicate the same needs. Carol tells me that, Joy and she have been successful in reducing a lot of the challenging behaviors by giving control to the student. The control she is referring to is achieved by redirecting inappropriate ways of communicating namely, biting, pulling cloths, making loud noise, to a more appropriate and acceptable form or by giving them access to communication books or devices. Carol says that by giving students the opportunity to communicate either argumentatively or by some other method, impacts their lives immensely.
I think the priority for us, in this field in this area, is to get the kids to communicate with the new boards, and you will reduce behavior problems (Carol, Interview 5/29/01).

This quote illustrates that these teachers saw a central goal of their work to make these students more competent communicators.

Socialization for passivity

The interviewees believed nonverbal children have lived a life of people not understanding them so they come to accept it and become passive. They accept that this is their life. Joy explains that when they were younger like 2 or 3 they might have been frustrated, but by the time she gets the students they are passive. She does not see them get upset because they do not know what is on there (the device). The passive nature of the nonverbal student interferes with the flow of interaction between the student and his peers. The nonverbal student is limited in their ability to initiate interaction and spontaneity within their conversations. Because of this, the nonverbal AAC user feels safe talking with adults more than with his/her peers. Joy attributes this to the fact the adults are safe.

I truly believe because number one we are safe and we follow all the rules. We follow all the communication rules we are safe we respond to them. We do everything they need. We fill in the blanks, we infer, we repeat back we do everything they need to make them successful communicators so we are the first ones they go to. (Joy, Interview 05/23/01)

Not only does the nonverbal student have to be taught to communicate but the verbal children too must be taught to use the device to communicate with the nonverbal person. Joy told me that many times, the students’ peers ignore them. Quentin and Brian
will talk to <another student> and he will ignore them. I had to tell him that I expected him to respond to them when they talk to him with the devices. In addition the students feel safe talking with the adults. The professionals believed that this has something to do with the way they have been taught.

The experiences of these students suggest that social aspects of communication must be explicitly taught. Part of the goal in the learning process is to get the students to understand when they are communicating. Stephanie explains a process that she uses.

So the kids are identifying photos; they are handing the photos to a person so that they understand that attempt to communicate and they understand the social aspect of... ok for me to be communicating, I have to communicate with someone (Stephanie, Interview 5/29/01).

**Passive nature and Teaching styles**

The traditional format of the general classroom, particularly at the high school level, is lecture.

They are not going to interact with the teacher; they are not going to interact with kids all that much because it is a lecture type class (Carol, Interview 05/29/01).

This particular format does not satisfy the general goal stated for inclusion, which is socialization. Carol says that in the regular classroom, there is very little if no socialization is going on there. The approach to teaching is, “I lecture... you listen”. This does not provide opportunity for the students to practice and further develop their communication skills.

Stephanie talks about a style in which the teacher asks questions and the students’ answer them. An interactive approach is considered more appropriate for AAC users. Carol believes that this is more effectively done at the elementary school level because
the classrooms are more interactive. Joy also agrees that a teacher must teach interactively in order to teach the AAC users successfully. The problem is not only focused on the integration of the student but also on his/her development.

AAC learners are already considered passive and the typical lecture format of the classroom will pose problems for them. Joy refers to a handout she gave me that talks about AAC users as being truly passive people. They just become naturally passive. The language structure of the classroom will make them remain as passive communicators. To make them true communicators, according to Joy, the teaching strategy must change. The handout establishes that both the physical and the social environment play a role in the child’s development as a communicator. The strategies are designed to increase the likelihood that the child would show interest in the environment and communicate (See appendix H) (Ostrosky and Kaiser, 1991).

Although the assumptions of the professionals is that the students are passive which affects the students interaction, I interject that the role teachers play is not passive in the construction of the learning environment (Conley 1993). The teacher makes many decisions and is largely responsible for creating the structure and content that allow students to engage in learning successfully (Conley).

Classroom Routines

The constant changing of activities in the general education classroom poses a problem for the student.

One day, they may be doing this and another day they may be doing that. It makes it hard for the Special Education teacher to know when to take the student into the room. This makes it difficult for the special education teacher to prepare for the student to go into the regular classroom (Joy, Interview 1 5/23/01).
Because of the time that is spent in the special education classroom, the speech pathologist believes that it is easier because she knows the routine in the classroom. I asked if she went into the mainstream classroom.

No. I'm wondering, maybe next year if I should. It just takes a big chunk of my time for one kid. Which I am not sure is -- you know what I mean? It is hard for me to justify when I have ten kids in here and I spend an hour and a half to meet with one kid (Joy, Interview 5/23/01).

This is one of the conflicts with sending a special needs student into the general education classroom. The low incidence of nonverbal students in the general classroom does not allow for the proper preparation of the teacher to deal with those children. Also collaboration is vital to the success of the placement. However, it is generally the teacher's aide that will follow the student into the other classes.

Conflicts of Collaboration

Collaboration between general education and special education seems to be a barrier to the inclusion of students with AAC devices.

Teachers have an option not to accept a kid in their classrooms. I think it has to do with personalities and I think you would tend to pick that regular ed. Teacher that you match more or your teaching strategy. I think if you go into class like (begins to whisper) the --- teacher isn't very open or receptive and they have a very hard time putting kids in her room (Joy, Interview 5/23/01).

The data suggest, in this district, it is not an expectation to accept special needs students in the classroom. So it is the responsibility of the special education teacher to build a rapport with the general education teachers. Here we see Delpit's (1995) concept
of power enacted in the classroom. She refers to how the relationships of authority determine how, what and where a student will learn. The relationship between the professionals also determines this as well.

I think Michelle here is better because I think she has built a rapport with the teachers and then she gradually moved into the classes as time went on. And the teacher at, I am not sure how much repertoire she built before she just barreled in and did whatever. I actually think if you are new in a school you better spend sometime, for your students’ sake, building some repertoire with the people you are going to work with. You know they’re not going to do all the work you are going to do this and that. It would be much more successful (Joy, Interview 05/23/01).

In this state, Joy is talking about the special education teacher at the elementary compared to other elementary special education teachers in the district. This places the onus of the responsibility of collaboration on the special education teacher. It contradicts the idea of collective responsibility. In most cases at the elementary level, a Teaching Assistant is sent into the classroom to serve as a liaison.

To be honest this year, we have had TA go out in the past and because the communication was so poor between what needed to be modified and us and the TA we sent out teachers. And that was much better (Stephanie, Interview 05/29/01)

Sometimes, this is not effective. For this very reason, at the middle school level, they opted to send one of the two teachers in the classroom with the student, the reason being that they could immediately implement strategies. Even with the teacher going with the student Stephanie says that because information on the curriculum is not shared in advance, many times they, (the teacher), even find them selves scrambling and trying to prepare the student for the class.
Collaboration seems to break down between the different segments of the system. An instance is the special education and the general education or the EMD and the TMD classes. The statements indicate that the conflict is due to differences in teaching strategies. Classroom routines are inconsistent from one class to the next and impacts on the sharing of responsibility for the student and his/her successful inclusion.

The classroom routines and collaboration efforts are also problematic for the special education classrooms as well. The classroom structure of the Elementary School EMD classroom is in conflict with the needs of the student as well, particularly when the structure is similar to that of the general classroom.

The classroom is divided into grade levels. The students' desks are in clusters according to the grade levels and the students move about according to the grade levels. The teacher works with each grade level separately when dealing with subject matter. The TA was not implementing strategy to increase the students' participation also student teacher interaction was limited. The collaboration between Stacey and Eboni was minimal. The responsibility is not shared each has a part that is his/her responsibility. For instance, in this classroom the speech pathologist did not know which classroom Taylor was to be mainstreamed into. This shows that joint efforts have not been made to ensure his success. Another example is the fact that the speech pathologist, Eboni did not program the device until I inquired about doing it for her. The teacher was not involved in the preparation of the device. In fact, I made the overlays and then told Stacey what I had done. Although I provided some blank sheets she did not give me any input.
Communication assumptions in the Classroom

In classrooms where communication skills are not explicitly taught the student is at risk of not socially interacting because he/she has not been taught how to interact, given the limitations in the mainstream language of the classroom. This concurs with Delpit (1995) in that she indicates that the dominant culture’s ways of interacting conflict with communication strategies provided by the AAC technology. She states the way in which the dominant culture codes are incorporated within the AAC strategy and the way the dominant culture incorporates the AAC strategies determine the way in which the AAC user will be taught. Nor has his/her peers been taught to interact with him/her. This impacts the implementation of the AAC system to facilitate social interaction. The teachers’ focus is not on communication but on the subject matter of the classroom and will not foster the use of the AAC. Thus, the integration of the technology is not achieved thereby possibly excluding the child who has been included in the classroom.

Apart from what Joy and the teachers on her team did, AAC devices are not largely integrated within the district. The teachers I observed did not interact or feel comfortable in using the devices. The high school and the middle school teachers were exceptions to this rule. Their interest in and appreciation for the devices were reflected in their interactions and curriculum as well as in the way their support staff manipulated the devices. At the elementary school level the handling of the devices was limited. While Joy was around, the device was used, but in her absence, it was in most instances ignored. For instance, Maya’s device was generally in the back of the room during my observations. The notion of communication assumptions is further explored in chapter 5.
Impact of the device in the classroom

Inconsistency using AAC

The practice of using AAC technology was inconsistent and dependent on the individual teacher or speech pathologist. The district does not have anyone that is currently working officially as the Augmentative Specialist, but many refer to Joy as the district’s Augmentative Alternative Communication specialist. Once again, there are no specific guidelines for the use and the prescription of AAC devices within the district. Nor are there guidelines for the training and preparation of teachers, speech and language pathologists, and support staff to prepare them to work with AAC students. However, they do have a general overall approved policy for Assistive Technology. The district also provides procedures but they are general.

Hum, (hesitates) you know, I, don’t see that being district directed, I see that being more of a personal interest from teachers. I know that is a terrible, terrible way to be educating our special ed kids but you know an example would be and I am not going to use a name, but I have a teacher that I got students from her classroom and her kids had an augmentative thing to use but she always complained that they never initiated anything. But she didn’t use the strategies to encourage initiation. So the kids would come out of there knowing maybe two levels on a device or knowing only one screen real well (Joy, Interview 5/23/01).

Responsibility for the device

Stephanie explains that Joy has tried to get others to be responsible for ownership of kids with Augmentative devices. It really has been a struggle because they all come back. Joy is requested to help other teams, adds more to her workload. In addition to her official responsibilities Joy has taken on the task of improving the use of devices in the district. She works at all three levels which is good because by time the students get to high school, they already have a device or form of communication in place.
Cognitive ability

According to teacher interviews, AAC students are academically significantly behind other students, and as they get older, they fall farther and farther behind. AAC students’ limited world knowledge hinders their ability to participate academically in classes such as science and social studies. World knowledge is the general background in which they can relate to issues of science and social studies (Stephanie, interview 05/23/02). The disability is assumed to be the reason why these children are not keeping up with their peers. Because of this, they will always be behind unless a drastic change occurs in the teaching methods.

Joy says that finding an AAC in this district that is not cognitively impaired is rare.

They are already worried about the 30 kids in class that are normal. This is just to be honest that has to learn math, reading, English and have to get certain Illinois standards that have to get covered in a year then to worry about this one little kid over here who is cognitively impaired whose setting over there with a one on one teacher and I think they probably assume he is there for social reasons more than anything else. Or it could be disability phobia. That kid is not normal, he doesn’t talk right. It depends on how open-minded people are (Joy, Interview 05/23/01).

The data illustrates that the perceptions of the students cognitive abilities do in fact limit the knowledge the students have access to. For example, in one of my observations the teacher verbally stated that she would give Maya an easy question. It was my interpretation that this was due to Maya’s limited verbal abilities and cognitive abilities, which are considered to be connected to each other.
Assessment of Cognitive ability

The structure of the device and the nature of the test make it difficult to assess the student’s cognitive ability. This raises questions of the legitimacy of knowledge acquisition. Does the information on the device truly represent what the student knows? Maybe not; but should not the information that the student uses to respond and elicit response be considered a representation of what the student knows?

Joy: you have nonverbal test and verbal test. You will have a test that has a verbal component and a nonverbal component.

Marsha: So then if a child is nonverbal then you have a verbal component. How do you supplement that?

Joy: That’s the problem. You can either supplement you know if they are cognitively high then you and supplement with writing. They could write an answer or they could have a machine.

Marsha: I mean if their pre-writing like kids....

Joy: it is very hard and they probably won’t score well. Unless

Marsha: so then it is possible to score them lower than they really are cognitively?

Joy: yes and the problem is you don’t want to set up a whole overlay that answers the test, because then you have setup the test

(Interview 05/23/01)

The children that we are discussing are for the most part cognitively low and some are also nonverbal. IQ testing which places them at a functioning level at the school determines this. The school testing consists of verbal and nonverbal components. For nonverbal children, it is a problem. If they are cognitively high, then, they may be supplemented with writing or a machine. But if they are at the pre-writing stag, it can be a problem. They may not score high marks. It is possible for them to score lower than they are cognitively disposed to perform. The problem is for the AAC users not to want
to set up a whole overlay with the answers because, then, they would have set up the test, meaning that it is possible to give them an erroneous high IQ score. The problem is that it is believed that the score is a reflection of knowledge the student has or that the answers are given. This may cause a discrepancy in the verbal and nonverbal scores. For these students, if they get a high nonverbal score, then, the verbal is brought to meet the nonverbal. Language ability is also a problem with the test. This is due to the student not understanding the questions and also their inability to answer in prescribed ways. This can be linked back to Delpit (1995) where she indicates that the acquisition of the dominant code correlates with the student’s ability to succeed. It is my interpretation that this could also relate to the AAC users ability successfully participate in the standardized testing which are an important part of the education processes in the U.S.

If you have someone that is highly language impaired the questions get so hard on the test they get to where they can’t even understand the question besides answer it. You know if a kid is suppose to answer in a sentence and he is nonverbal well you know (Joy, Interview 05/23/01)

Joy says she does not care about standardized test for this reason, especially the language portion. An example is the one, which has questions using plurals. Her kids do not understand it in the Standard English sense. Joy says that language is functional and serves the purpose and that for her, the form is not important. The test is not compatible with the communication structure of the AAC device.

Generally speaking, the teacher has the control of the information that goes into the device, unless the student requests something. Once again the teachers are amazed when a student asks for something without being prompted. This is because the
nonverbal student is generally considered a passive communicator. Basically the teacher or the speech pathologist has the control of what goes onto the device. Because the professionals are the ones who decide what goes on the device they are also deciding on the type of social interaction the student will have.

That is really a tough area because we are having to decide what type of social interaction we think that child wants to have, and that is guessing. You know, you can go through and you can hear what the junior high kids say and how they interact and you can say well maybe he wants to say this or this would be a good time to say that (Stephanie, Interview 05/23/01)

What is on the device reflects the professional’s interpretation of what the student needs so as to communicate with the device and what the student is capable of doing with the device.

The students have limited input as to what information is placed on the device. She says that she has asked them if they wanted something on there and they have ignored her. However, there are students who do get to have things that they want onto their devices. Joy says that it depends on what is going on, whether or not the students get to decide what goes onto the device. If she is trying to teach new concepts, then, she loads the device with what she is going to teach. She says sometimes the students would not know what to put on there. There are some things that the teacher has to provide to make the student a more competent communicator. An example is about the devices that require overlays to be changed. Joy says that a student would not think to put “I need a new overlay”.

Students do not have input into what goes on the device unless they are high functioning. It is done a couple of ways. If we are introducing something then no the student doesn’t have an input. The teacher controls content when trying to teach something. Nor would they be a part of picking picture level (Joy, Interview 05/23/01)
This statement is connected to not only the control of knowledge the teachers and speech pathologist has, but is also associated with the importance of collaboration and social interaction within the different situations in which the student might be included.

The relationship between the information on the device and the students ability to demonstrate their cognitive ability is interesting, specifically due to the fact that the professional, who is the keeper of knowledge in the classroom is the one who is responsible for the information that is on the device.

Summary

In this section, I have discussed inclusion, communication, the device, and assessment. The overall theme was the interpretation of an informal philosophy, which created a structure, which was flexible and directed by the interest and knowledge of the professional staff for the population of students in this study. The themes saturate all the areas such as the interest of the teacher and the speech pathologist, the collaboration efforts, language and communication, which must be explicitly taught, and language that is related to the cognitive abilities of the students. This analysis has brought about more questions than answers but does show that some considerable thoughts need to be given to the communication needs of the nonverbal student if he/she is expected to succeed in a culture that values verbal ability as well as to have a good quality life.

At the moment, AAC is not a given in the field of special education or speech language pathology. It is not mandatory that AAC technology be implemented in the classroom. As stated early in this chapter it is left to the individual teacher's discretion. In addition, the local university in this area only offers one class (at the time of this study)
in the speech pathology program, which deals specifically with Augmentative Alternative Communication. It is fairly new and depends on the mindset of those who facilitate it. Although it is said that an IEP team meets a special education student's needs it is still those in the trenches such as the teacher, speech pathologist, and support staff who must carry out the goals. Not having specific guidelines appear to be problematic as the utility of the device is greatly compromised if those who teach the student are not knowledgeable or interested in the use of the device. Should there be some specific guidelines? This is a question I cannot answer. But what is the point of providing a child with a device if those who will teach him are not knowledgeable or interested in the use of that device? It will be extremely difficult for educators to assess whether a student will ever be able to function at higher cognitive levels if the device is not properly used to tap her/his potential. Because there isn't any consistency about the use and the implementation, a student might use the device for just one year as part of every activity and discard it in the next year or class session the hope that the child will use the “natural speech”, for instance her is an example of the teacher not incorporating the communication strategies of the AAC technology.

“I must admit at times I don't use the device I try to get him to use his words (Safi, field notes 4/30/01).”

This statement indicates that the “natural voice” is valued over the artificial speech of the device. For the student in question the device contains his words. It provides him with the ability to verbalize those words. This is an example of the device not being accepted as a legitimate part of the student.
General education practices build on knowledge each year, culminating in preparation for college or a vocation. The gap in learning and usage of the AAC devices becomes problematic for nonverbal students. It perpetuates their low cognitive abilities by continuing to ignore the importance of their ability to interact in the classroom environment and accessing equal or equitable educational opportunities. The children will continue to communicate in minimal ways and continue to be passive communicators, resulting in minimal access to knowledge that will promote academic growth.

The implications of the ambiguity in the policies associated with the application of the technology and the inclusion of the special needs student was illuminated through the various barriers throughout this chapter. The chapter suggests that this ambiguity is creating disabling environments for the usage of AAC technology. The chapter focused on barriers associated with the professional’s perception of the implementation of the device and the inclusion of the student. Therefore the inclusionary environments can be exclusionary in that the students in physically included yet the student is excluded from the activities are limited in participation due to the limited ability to communicate. The implications of these barriers are further discussed in chapter 6 by review of original questions.
CHAPTER 5

TEACHERS COMMUNICATION ASSUMPTIONS: (DIS) ABLING AAC TECHNOLOGIES EFFECTIVENESS

Introduction

This chapter provides case examples to further illustrate the impact the social environment has on the implementation and usage of AAC technology as a language mediation tool. The chapter emphasizes the centrality of the communication in the successful implementation and usage of AAC technology.

As discussed in chapter 2, language is a communication system, which humans use to express themselves. Chapter 2 also established that children use language to communicate and to learn, and that children learn language without explicit instruction (Jaggar & Burke 1985). However the latter is not the case for students who are nonverbal. The classroom environment, which does not provide explicit instruction in communicative uses of language, disables the AAC potential. I, therefore, show that those classrooms that use communication-based instruction\(^1\) are more effective in using the AAC as a language mediation tool are classrooms, which support the development of

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\(^1\) Joy defines communication-based instruction as instruction that explicitly seeks to improve the communication competency of the student by incorporating the development of communication skills within all of the activities in and out of the classroom. Communication is a priority within the type of instruction.

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the students' communication skills using AAC by implementing a communication-based instruction are also those classrooms in which communication skills are explicitly taught; and then, there are those classrooms, which do not support the development of these by not explicitly teaching communication skills and the explicit implementation of AAC technology. The literature suggests that explicit teaching of communication may be limited because communication is generally assumed to be intact when students enter school (Asha 1982).

The first section will illustrate those case examples in which the implementation of the AAC device provides minimal support for communication development. The next section provides case examples in which communication is the primary goal.

Case Example 1: Educable Mental Development (EMD)

These case examples provide a picture of the implementation practices and usage of AAC technology in a non-communication-based learning environment.

Background

During research activities, I observed two elementary school students. In this study, I call them Taylor and Maya. In this case example, the students were observed at separate classrooms, and students were in separate grades. Taylor was a 1st grader who was also mainstreamed for two 30-minute periods a day during the 2000-2001 school year. Taylor had multiple disabilities that affected his speech and physical abilities. He had functional use of his hands although his motor responses were slow. At the time of

2 Their names have been changed to protect their identity and privacy. Joy, the speech pathologist who was my contact person within the district, selected the students. Her name has been changed as well.
my observation, Taylor was typically seated in a high chair on wheels, which he was not able to move independently. To augment his speech impairment, he used an AAC system called the Macaw. The Macaw is a 32 key direct select computer-based communication aide. The device has the capacity of 32 levels. The levels do not represent difficulty but the amount of information or data it can hold. Taylor’s knowledge is represented by a series of overlays (see appendix G). Subjects or themes generally categorize the overlays. Taylor’s interaction in the class relies solely on his ability to communicate. Joy was Taylor’s speech pathologist. She actively advocated AAC to improve the communication competency of the students. Her focus was on both speech and communication where as the traditional speech pathologist primary concern is speech.

Maya was a 2\textsuperscript{nd} grader who spent the majority of her school day within the special education classroom. She has mild cognitive disabilities and verbal impairment. Maya’s nonverbal expressive language is intact. She is very sociable and demonstrates some behavior problems at times. Maya family speaks Spanish at home. At school she is immersed in English. Within the classroom, there is a bilingual teacher’s aide, however the teacher and the speech pathologist speak English only. Maya’s device is programmed in English. She was also included in fine arts classes outside the special education classroom. Eboni was Maya’s speech pathologist. At the time of my observations Eboni had minimal knowledge of the AAC device Maya used. Eboni’s focus was on speech rather than communication. Maya’s interaction was not limited to her ability to speak. Maya’s social interaction in the class occurred despite her limited use of her AAC device. Maya also had a McCaw.
During the 2001-2002 school year, I returned to observe Taylor in his 2nd grade classroom at that time Eboni was his speech pathologist. Maya no longer attended the school in which I was observing.

The Classrooms

In this example at the elementary school, three different classrooms were observed. The first two were the general education classroom in which Taylor spent 30 minutes of his time each day and the EMD/TMD classroom where he spent the majority of his day. The third classroom is the EMD classroom, in which Maya was observed during 2000-2001 school year and Taylor is observed 2001-2002 school year. These cases provide a picture of what it is like in the classroom for EMD students in need of language mediation tools.

Usage of device not encouraged

During my observation, I never saw Maya search for the device when it wasn’t near her. Nor did I observe the staff, other than the speech pathologist; make sure that she had it during an activity. In all the activities, Maya was able to participate physically such as during a social board game but she was not actively and comprehensively able to vocalize her thoughts during the activity. Expectations were not there as far as Maya’s usage of the AAC device.

Vignette 1

Once again Maya was participating in a social activity yet her device was not accessible. This time, the class was working with the psychologist. They were playing a social game, which asked questions about various
social behaviors. The students took turns rolling the dice, moving and then answering corresponding questions. Maya rolled the dice and moved. Her task was to tell the class a funny joke. This was not possible for Maya because she did not have the voice. Instead of requesting that Maya go get her AAC device so that she could talk to them, the students and the psychologist encouraged her to do a dog impression. After some encouragement by the group, Maya stuck out her tongue and began to pant like a dog. Acting like she was licking the students like a dog. (field notes 05/08/01).

This could have been an opportunity for Maya to use her device in a meaningful interaction. The potential to help in social interaction is difficult if the device does not become an integral part of all interactions in the classroom. In fact Maya was being encouraged to interact in a way that would be in other situation inappropriate.

Implications of limited access to the device

Both the mainstream classroom and EMD classroom provided limited opportunities for Taylor and Maya to interact verbally using their devices. This seemed to be due to several factors. For instance, limited access reduced the usage of the device in this example; access refers to the ability to reach the device when needed. This was imperative to Taylor, especially, because he was unable to retrieve the device on his own. Even when the device was within his reach, if the facilitator turned it off, it limited Taylor’s access thus hindering his ability to communicate verbally. Maya also had limited access to the device. The device was not within her reach during much the period of my observation. Although Maya did have the ability to retrieve the device on her own she never did so. Nor was the device retrieved by the teacher or teaching assistant. The only exception was with the speech pathologist. The device was accessible when the
speech pathologist was coming to work with the class. Although Taylor was included in the mainstream classroom, his participation was minimal and it did not encourage the development of his communication skills. The activity in the classroom was not conducive to Taylor's participation. For much of the time, Taylor was present in the classroom but worked with his aide or with one other student. Even in this type of situation, his social interaction was minimal.

Vignette 2

The first day I met Taylor and his mainstream teacher, Taylor was sitting in his wheelchair, away from the other students. The aide was cutting and gluing paper for him. At this point I was on the outside of the classroom looking in waiting for the class session to end so that Joy could introduce me. As we stood and watched the class, Joy noted that the device was hanging on the back of Taylor's chair out of his reach. I later learned that this was not a one-time occurrence. For instance, on another day, I came into the classroom to observe what Taylor was doing. On this particular day I walked into the classroom when the class had already begun. The students were all sitting on the floor around a big mound of dirt except for Taylor who was still sitting in his chair. The students and the teacher were counting the number of worms that were in the dirt. As they counted, the students were to estimate how many worms they thought were in the dirt. The students were counting along with the teacher as she pulled out a worm. All except for Taylor because his device was hanging on the back of his chair (Field notes 4/30/02).

Denial of access to the device limits the student's opportunity to practice using the device in meaningful activities within the classroom. Access to the device in this scenario is related to the student's being able to reach the device. In Taylor's case, the device was frequently on the back of his chair. Because of Taylor's other physical limitations, he is dependent on his facilitator to make sure it is available and ready to be
used. It also limits the facilitator or teacher's ability to determine what functions need to be developed and further worked on.

Maya's is another example in which access to the device becomes a barrier to its use. In Maya's case she is able to retrieve the device herself; however, she does not and the facilitators in this class do not require her to do so.

Vignette 3

Today the teacher calls the group of students to the reading area to use what she calls their "thinking caps". As the students move to the rug she tells them to put on your thinking cap. It is about 15 minutes until lunch. Stacey is sitting in a chair on the rug. She pulls out a stack of brainteaser cards. She goes around the whole group of students asking each of them a question from the deck of cards. When you come to Maya she says, "I will give you an easy one" Maya's question was, what is today? Maya made some sound that was not understandable. Stacey then uses sign language. Is it Monday or Tuesday (using sign language) After several attempts to get Maya to answer, Maya did the sign for Tuesday. Stacey said no it is Monday and used the sign for Monday. After everyone answered one question it was time for lunch. (Field notes 05/15/01).

This illustrated the lack of encouragement for the use of the technology. It also shows the inconsistency in the approach to increase communication competency. Maya device at the time of this particular activity was in the back of the room under some papers.

Importance of verbal interaction

At the time of my study both Taylor and Maya used AAC systems minimally. For them, the AAC device was used most with the speech pathologist's support. Due to
Taylor's disabilities, he is unable to clearly speak beyond simple words as "yeah" and "no". Taylor's verbal impairment poses a real social problem for him at school. The social implications of his inability to speak are monumental in the formal education setting because verbal ability is highly valued. Verbal ability allows for assessment and therefore considered to correspond to cognitive ability. It is the mechanism through which the social takes place. It is believed that verbal ability impact reading and writing. It has an impact on a person's ability to learn a language and thus understand and participate in a culture's experience. Taylor's disabilities become a major social problem for him. He has to learn to adapt to his environment. But the social environment must change as well. He has to use supplemental tools for what he is unable to do biologically. Due to the social construction of what it is to be a "normal child", those who do not meet the standards of normalcy of the schools are typically educated in separate environments. The type of education and success achievable is based on the social perspective of what the student is believed to be able to do. For Taylor, it is his disabilities that have social consequences that impact his experience in school. Taylor's cognitive abilities have been determined by IQ testing and the body of knowledge associated with his condition, the field of education, and the field of speech communication. Based on his scores, Taylor has been labeled as "educable" (EMD). This title has determined what and where he will be taught.

Maya uses gestures and sounds in many instances and is understandable if you know the context. During my observation, Maya rarely used her device when I was in the classroom. The device was used once during weekend sheets with Eboni, her speech pathologist.
Maya: Went bowling
Eboni: you went bowling this weekend?
Maya: yes (verbally)
Eboni: Someone ask her a question. She says she went bowling.
Student: Whom did you go bowling with?
Maya: Ma- (verbally), mom (device) Da- (verbally)
Eboni: and dad too?
Maya: Dad (device)
Eboni: you went bowling went mom and dad?
Maya: [Shakes head yes]— yea (verbally)
Eboni: Did you have fun?
Maya: yea (verbally)
Eboni: Did you have anything good to eat?
Maya: [shakes head yes] – po (verbally)
Eboni: you had pop?
Maya: yea (verbally)
Eboni: What else did you do this weekend?
Maya: [looks at device makes movements as to dancing]
Eboni: It was nice outside did you play?
Maya: [points to a cell on the device]
Eboni: tell me (field notes 04/30/01).

At this point Eboni is telling Maya to tell her meaning she wants her to use the device.

Maya: music
Eboni: [pushes the button I first, then, points to music]
Maya: I music (device)
Eboni: You listen to music?
Maya: yea (verbally)(field notes 04/30/01)

Here Eboni is trying to get Maya to use a more complete statement to answer the question. Eboni pushes the “I” and “music” on the device. She models this for Maya to repeat. Model is a good way the teach students to use the device, however, I did not understand the purpose of Eboni trying to get Maya to
use I music in place of just music. Both are incomplete statements that must be placed in context and possibly followed with a question to clarify.

Eboni: that sounds like fun someone, someone ask her something about dancing.
Eboni: ask her whom she danced with?
Student: Whom did you dance with?
Eboni: [repeat the question] Whom did you dance with?
Maya: friends (device) [Maya looks at device points to symbol representing friends verbally says friend. Maya looks at the device and then utters something to it and says “friend” with device.
Eboni: sounds like fun. Is there anything else you want to tell us about? (Field notes 04/30/01)

Maya goes on to talk about playing on the trampoline and watching video. Other than the one interaction between Maya and other students, Maya’s verbal interaction was with the speech pathologist. Maya was very talkative during the weekend sheet activity with the speech pathologist. However, once Maya was no longer doing the talking, she no longer participated in the activity. While the other children did their weekend sheets, Maya put her device away and began working on something else. The speech pathologist tried to get Maya on task but she was not cooperative.

Legitimacy of exchange

Providing the student with an AAC device alone is not enough. The device and the language represented on the device must be accepted as legitimate exchange. Social page is an overlay that has general information such as request for something to drink, to say “hello”, or to tell how he (Taylor) feels. In the following excerpt Taylor attempts to interact with the TA. During this exchange the group consist of Taylor, TA, and another
student. The student was supposed to be showing Taylor some pictures and he was to say "yes" or "no" if they were things that made soil.

Assistant: Taylor said the picture of the ice cream, I asked him if it help makes soil he said no.

Girl: shows Taylor a picture.
Taylor: yes, yes.
Assistant: you think so?
Taylor: I need a drink
Assistant: try again (repositions the device)
Taylor: I don’t feel well
Assistant: try again (moves device seems to be irritated)
Taylor: I want a drink
Assistant: Taylor is this a living thing?
[Taylor doesn’t answer. Teaching Assistant moves device out of his reach. Never responds to his needs. She accepts them as mistakes. ] (Field notes 05/14/01)

The excerpt above is a transcription of an interaction between Taylor and the aide. This exchange shows that at times, Taylor’s verbalizations are questioned. This would have been an opportunity for Taylor and the aide to learn the use of language, but in this case express communication was ignored. Not only was he ignored, but also the aide exerted her power over Taylor by removing his ability to express himself when she took the device away. It seems that these types of social interactions are what create a passive communicator because the student is frustrated and just gives up.

If social interaction constitutes the language development and shapes the reality of the student, then, what type of experience will these students have? These are the type of situations that impede learning and construct the passive communicator. Passive communicators are not “normal”; they are constructed by their experiences. Passivity is a message of frustration, or it conveys that “I give up”- an expression of resignation.
Social process of learning language

Jaggar and Burke (1985) assert that language learning is social and collaborative; that children learn language within meaningful interactions with others who provide models and support. For AAC nonverbal students, social interaction is limited primarily to the adults in the classroom. In these cases, very little interaction occurs between the teacher and the student on the one hand, and the student and other students, on the other hand.

The majority of Taylor's academic activities occur in a special education classroom. As mentioned earlier Taylor is included in the general classroom for two 30-minute class periods. In the general classroom, Taylor has very little social interaction with his peers or with his general education teacher. I was told that social interaction is the purpose for Taylor's inclusion in the general classroom, Taylor's main interaction occurs between him and his aide. Taylor is included physically, but the environment is not conducive for communication and learning for him. Is this the most appropriate learning environment for him? The social environment of the classroom does not provide opportunities for Taylor to learn. Models are not available for these students.

Throughout my observations in the classroom I did not see Maya use her device during activities in the classroom. At many times, the device was not accessible to her. Maya was capable of interacting on a social level whether she had her device or not. The students in the class were used to communicating with Maya. She was very expressive and initiated interaction when she wanted. Other than her occasional behavior problems and limited speaking ability, Maya was just as active as any other child in the classroom.
However, her verbal communication skills were not supported by the classroom
instructions. Because these students have limited experience-practicing communicating
with their devices, they do not effectively learn how to use language to think and learn.

Opportunities to practice

Taylor's participation relies completely on his ability to communicate. Yet, opportunities for him to practice are minimal. For example, children learn to use
language through meaningful interactions. Those interactions are not readily available
for Taylor despite the fact that his inclusion is on the premise that the social interaction
would improve his academic experience. The theoretical perception is that if Taylor
interacts with his able-bodied peers, he will learn to communicate with them. The
communication must be explicitly taught to both Taylor and his peers.

Communication does not seem to be an integral part of the whole academic
erience for Maya. Unlike her speaking counterparts, Maya does not have the
opportunity to practice and model someone else. The environment does not encourage
the use of the device and thus limits Maya's ability to develop higher order language
skills and, consequently high levels of learning.

I noticed also that although Maya is in an educable classroom she has a lower
level device whereas the students at the middle school and high school who are placed in
trainable settings have more sophisticated devices. This might have something to do with
access. Maya did not own her device. In fact I was told that Maya didn't even take the
device home because her mother spoke only Spanish and the device was in English.
Verbal interaction

The other students occasionally tried to interact with Taylor, but the opportunity to teach was lost. For example, during the Henny Penny reading lesson, one of the students asked Taylor “Do you like me?” Taylor did not immediately respond to the question. She asked him a second time. This time, Taylor responded, “I love you”. It was interesting to note that Taylor’s device did not have the expression “I like you”. Instead of using the opportunity as a teachable moment, they possibly discouraged future student interaction with Taylor. The babysitter who was also observing for the day told Taylor, “No, we don’t love anyone”. It would have been a good time to restate the response: “Yes, Taylor likes you. Why don’t you ask him some other questions and facilitate the interaction?” Instead, they stopped the student-student interaction here. This illustration demonstrated the problem when linguistic categories don’t seem suited to the very important social communication students need to carry out in school, such as being able to say, “I like you” instead of “I love you.”

Teacher/student interaction

During my observations, I saw the teacher interact with Maya only during a group activity when the students were asked some questions. Maya’s device was on a back table under some papers at the time. The teacher did not require Maya to go and get the device. Instead, the teacher found a question that Maya could answer with a “yes” or “no”.

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As a result of expectation, teachers reduce the amount of information and knowledge they present to students, based upon the perceived abilities. Sims (1982) states that where teachers' assessments of competence are influenced by the language children speak teachers may develop low expectation for certain students and subsequently teach them less, which links language to thinking.

For instance Taylor's teachers and aides were the least familiar with the device. They had little interaction with the device during my observations. Nor was there much input into what the device should do for Taylor. The device has little impact in Taylor's academic experience.

Taylor had three teachers, two speech pathologists and two aides during the time of my observation. Taylor interacted the least with his peers; this is in both the general classroom and the special education room. Most of Taylor's time was spent with his TA; yet, the interaction reflected the teacher's involvement. However, the speech pathologist with which he had the least amount of contact was the most knowledgeable about the device and ways to encourage its use. With Joy, Taylor was very conversational; yet, outside that interaction Taylor was a very passive communicator.

Impact of Teaching strategy on the usage of AAC technology

In the general classroom, Taylor doesn't interact anymore than he does in his special needs classroom. Ironically, Carol (05/29/02) believes that it is easier to include students with verbal disabilities at the elementary school level because the classroom structure is interactive. It is not just a lecture style of teaching---teachers ask question and the student answers, as it is believed to be in the upper level general education

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classroom. The classroom structure is set up for students who are able to move around freely. Although the other children in the classroom were moving from station to station, Taylor was stationary. He did not experience the interactive and constructive nature of the activities in the class. He simply was asked “yes”- “no” questions and was expected to respond. This activity did not provide the opportunity for him to interact verbally and to learn how to further use the AAC system in this environment. It seems that the teachers approach to teaching directly impacted the implementation and usage of the AAC technology.

Contradictions of passivity

The data suggest that the passive nature of the students result in limited social interaction. However, the observations revealed that students may be passive in their usage of verbal communication doesn’t necessarily mean they are passive in general. For example, Maya is an example of a child who is not passive in general. She is a very energetic Mexican female student who is bilingual and unable to speak clearly. She is capable of some words verbally, such as “hi”, “bye”, “yeah”, “no”, “mom” and “da”. Maya’s nonverbal communication skills are intact. Maya is not passive. She is very social with her class. However, Maya does exhibit behaviors for example, hiding under tables or refusing to participate that are not appropriate for the classroom.

Uncharacteristic of the passive nature that has been discussed in literature and those interviewed in the study, Maya does not meet the characteristics of being passive. She is physically included in the classroom. She is very active and bossy at times. She is very aggressive and expressive. Maya initiates conversation or interaction. She is
stubborn and participates when she wants to do so. Her classmates accept her and interact with her. Socially, Maya is a part of the classroom; it is her academic and verbal participation that is in question. Maya was playing on one of the computers. The teacher was printing some pictures from a field trip and one other student was present. I decided to talk to Maya to see what she could do. Instead, she took charge. She led me and the other student to the reading area. I tried to get her to let me ask her questions but she was not having it. She insisted on using her gestures and sounds to indicate that we were to sit down. Then she began pointing at an overlay from her device. We were to tell her what she was pointing at. During another time when I was in the room, Maya refused to participate. She went and sat under a table. I encouraged her to come out by asking her if she wanted to see what I had brought with me today. She said “ya” which I understood to mean, “yes”. I had a book for practicing letters. It was a wipe and trace book. I tried to get Maya to trace letters. However, she wanted me to write her name. So, she would turn to the proper letter and I would write her name or mine. She would ask by pointing and saying ‘na’ which I understood as “name”. These are not signs of passiveness. Maya is not passive but at times she withdraws. This could be due to her inability to communicate and the level of frustration that she might be facing.

Cognitive /knowledge construction

Not only do the types of interactions construct the type of communicator, but also the person who programs the device has the power to determine what types of knowledge the user has access to. It is not an easy task to determine what to put on the AAC device or whether it should be taken lightly. The person who programs the device must make
some important decision for the student. Hetzoni & Harris (1996) indicate that this is why it is important to understand the student’s culture when planning the AAC strategies. As I reflect on the experience, I realize that this understanding was not valued. I had the opportunity to program a device during a pilot observation in which I was a volunteer at an AAC communication camp in Central Illinois. We knew very little about the campers we were programming the devices for. We programmed the devices based on the context of the next day’s activity this was done while the campers were sleeping. I also programmed the device for Taylor during my actual observations. Once again, I did not know much about Taylor. I was not aware of his goals in the class or what he was expected to do. All I knew were some of the activities that took place during class, and then I thought about things that I thought an average 2nd grader would need to know. All of this was done and then mentioned to the teacher. I was given the power to make these decisions. Thus, I held the power to control what knowledge he had access to. The teacher then must know what is available to Taylor and provide an environment that promotes opportunities for him to learn the language and use his language and knowledge to interact in the classroom. However, the device poses problems although it is offered to Taylor as a solution for his problems.

Impact of limited collaboration

Prior preparations do not seem to take place in an active effort to improve Taylor’s academic experience. The following observation demonstrates that no prior preparations were made for Taylor to participate in the classroom activities. It also demonstrates that his attendance is not valued as important.
The data suggests that the device was not perceived and valued as an integral part of Taylor. It seems as if AAC technology has taken on the same space as the personal computer has taken in many classrooms. The literature indicates that collaboration is imperative to the inclusion process. However, the data within these first examples beyond the initial IEP meetings subsequent collaboration efforts are limited. The following observation excerpt reflects the lack of preparation, which is a result of lack of collaboration.

Assistant: Sorry we are late (walks over to me leaves Taylor in the front of the room alone) is there something you want us to do? So what is it you want us to do?
Researcher: No, no I want you to do what ever you normally do. I don’t want anything done special, just whatever normal everyday.
Assistant: oh, ok Monday they do centers or groups so it’s not really where he is in the classroom. Just kind of doing what the whole class is doing. So it might be where maybe another child might read a story to him so it might
Researcher: so what day do they do stuff when they are not in centers?
Assistant: Tuesday through Friday
Researcher: Tuesday through Friday, ok.
Assistant: So, uhm usually when he is in a center or even sometimes when I bring him into 1st grade Safi has kids do something with him rather than have me right by his side helping him doing something. So that’s why I was asking I didn’t know.
Researcher: no I just want to see whatever
Assistant: Whatever his routine is?
Researcher: yes.
Assistant: ok (Walks back to Taylor)
(Pushes Taylor over to Safi. His device is hanging on the back of his chair)
Because of where I am and the camera I cannot hear all of the conversation between Safi and Teaching Assistant.
Assistant: ask Safi what to do.
Safi: tells her to let Taylor look for pictures that are of living things.
Assistant: (moves to a group of girls.) Are you girls looking for pictures?
Safi: (walks over to group. Girls are not looking for pictures yet) You guys are working so hard. Taylor is going to join you looking for pictures. (Brings magazines over to the group) (Talking to the
two students) your job today is to look for pictures that we know helps make soil. (Safi is flipping through the magazine) (Taylor's device is sitting on a desk in front of him about two inches lower than his table. It is out of his reach. Taylor is not sitting in a general chair. He is in a chair that is on wheels and has a tabletop. It is much like a high chair.) (Field note 05/14/01)

It seems that the teachers and the TA did not get together prior to class to make plans on how to facilitate Taylor's participation in the classroom. I questioned Joy (field notes 07/17/02) about the collaboration among the group of professionals responsible for Taylor at school. Joy told me that the team is only required to meet once a year. That any other meetings are not required. I was also told that no other meetings took place. The TA was to serve as the liaison between the general education teacher and the special education teacher. The data presented here suggests that the lack of collaboration impacts on the type of participation Taylor has in the classroom.

Summary

Taylor and Maya's situations are different yet similar. They are different due to the severity of their physical limitations. Taylor is not only verbally limited but he is physically limited, Maya does not have any physical limitations her limitations are cognitive and verbal. Both of their limitations play a significant role in the shaping of their educational experience; however the crux of the experience relies on the teacher's communication orientation in the study. Turner (1996) in her dissertation on teacher's perceptions of inclusion supports the impact of authority figures orientation as directing the practices of inclusion and the use of various materials. This section demonstrated that some teacher's orientation served as a barrier to the usage of AAC technology to
improve the communication competency of the student. The next section illustrates a mindset that supports the usage of the AAC devices. The question then becomes: Is the AAC user effectively participating in the classroom to improve on his/her social interaction and their academic growth? What is considered participation? What is the goal academically? How does the device help in the social process of participating in the learning and social activities of the class?

Case Example 2
TMD Classrooms

These case examples provide a glimpse of what was perceived as effective uses of communication strategies in the classroom in order to more fully foster inclusion of the AAC student.

Background

At the middle school, I observed three students all of whom were males. Two were white and one was black African. The two white students have Down syndrome. The African student has sickle-cell anemia and has suffered a stroke at the age of 5. As a result, he has limited verbal and motor skills. All three of the students used an AAC device to augment their limited verbal abilities in order to improve their communication. All were using the Dynovox. The decision to use the Dynovox was encouraged by the teachers and the speech pathologist. When I initially began to observe this activity, the African student used a Mccaw. The teachers stated that the Mccaw did not meet his needs. It did not have the capacity to extend to the level of learning that he was capable
of. Also, the Mccaw required changing overlays, which was difficult for the student at many times. It was also difficult to keep them in good condition with all the handling.

The Dynovox eliminated the need for overlays because of its dynamic screen. The dynamic screen is similar to the personal computer screen. But it had the touch screen capabilities. With the assistance of the teachers and the speech pathologist and some local organizations the parents were able to purchase a Dynovox for the student. So at the time of my official observations all three students were using the same device, the Dynovox.

The final observation site was at the high school. In this setting, I observed two male students who used AAC devices in their classrooms. Both students were white males. One student used a liberator and the other a Dynovox. However, during the time of my observations, the liberator was not working. The students shared the Dynovox. During this time, I observed the two students during several activities, all of which had communication as an explicit goal and expectation. In both the middle school and the high school communication was a classroom expectation and the staff sought to teach all their students how to communicate. An example of this is in the community preparation activities and exchange. Community preparation occurred prior to going out and using the device for interactions, this gave the students opportunity to practice communicating with their devices prior to going in the community.

The Classroom settings

The middle school students observed were placed in Trainable Mentally Developed (TMD). At the middle school, they occupied a separate hallway from the other students. It consisted of four classrooms and the teacher’s office space. I observed
the students in two of the four rooms. The larger of the rooms was the main classroom area. The other room I observed was where the students worked in smaller groups with the speech pathologist or teachers and staff. This room also served as the work area for the speech pathologist and as a meal area for students who needed assistance. I did not do the observation in the stimulation room. This room had visual and physical equipment such as lighting, ball and computers to manipulate to stimulate the students. Nor did I observe in the workroom where the students were to work on training skills.

Although I was observing in the special education setting, the demographics of the students in the class were diverse. The mental and physical state of the student population ranged from mild to severe disabilities. There were nonverbal and verbal students, ambulatory and non-ambulatory students, and those who were severely to moderately cognitive and with physical disabilities. Yet, the inclusion of all the students was the goal of the classroom. The teachers and the staff worked together to ensure that the students participated according to their potential.

As the following vignettes illustrate, communication was an integral part of the curriculum. The teachers and staff explicitly sought to teach communication skills at all times. The students were not separated according to their disabilities. They worked with both the verbal and the nonverbal as a group.

This particular observation was of Stephanie working on reading with three of her students. Two of the students were using AAC devices and one student was verbal. They were all sitting at a square table. The devices were on the table. The top of Kai's device blocked his ability to make eye contact when communicating or talking to the others during reading. He had to look above the device to see the other students and the
teacher. The top of the other student's device had been removed because he messed with it too much. It was evident in this exchange that the use of the device was expected and that communication was an integral part of the classroom process.

Stephanie: who would like to work with me first?
Tyler: my turn

[Although they are in a small group they work as individuals. While Stephanie is working one on one with one student the others are during individual task.]
Stephanie: Good job starting chucks good job starting David. Alright
Stephanie: Tyler gets ready, read the word. (Points to a word on her paper)
Tyler: poison
Stephanie: Good, Tyler point to the word fire. (Tyler places his finger on the word) read the word. (Tyler takes a while to read the word. He looks at the device) Fast, read (Stephanie uses a pointer to help)
Tyler: Fire, Fire
Stephanie: Tyler point to the word girl (Tyler points to the word on Stephanie’s paper) read the word
Tyler: Women’s restroom
Stephanie: Good job Tyler, (Stephanie points to a word on her paper) read the word
Tyler: elevator, women’s restroom
Stephanie: good Tyler
Tyler: elevator
Stephanie: Tyler get ready hands down; hands down (moves his hands) Tyler read the word
Tyler: Fire, Fire
Stephanie: Good, Tyler point to the word in (Tyler points to the word) read the word
Tyler: in, in
Stephanie: Tyler point to the word in, read the word
Tyler: in, in
Stephanie: Tyler point to the word in, read the word
Tyler: in, in, in
Stephanie: Tyler read the word
Tyler: in
Stephanie: Tyler read the word
Tyler: Tire
Stephanie: Good job Tyler, Tyler point to the word girls
Tyler: Women’s restroom
Stephanie: Point to the word in
Tyler: in, in, in, in
Stephanie: Tyler point to the word in
(Tyler points to something and then begins to read something)
Try again. (Tyler points to another word) Good.

Tyler:
in, in, in, in, stop
Stephanie: Tyler read the word
Tyler:
in
Stephanie: right, Tyler read the word
Tyler: Women's restroom
Stephanie: Tyler read the word
Tyler: poison
Stephanie: good, Tyler point to the word
Tyler:
out
Stephanie: Try again
Tyler:
in
Stephanie: very good, point to the word in, Tyler point to the word in, good
read the word
Tyler:
in
Stephanie: good. Tyler read this word (points to a word)
Tyler: Poison
Stephanie: good job, Tyler read this word (points to word)
Tyler: Women's restroom
Stephanie: good, Tyler read this word
Tyler:
in
Stephanie: good, Tyler read this word
Tyler:
fire
Stephanie: read the word
Tyler: exit
Stephanie: read the word
Tyler: men's room
Stephanie: Good job, and Tyler your turn is
(Tyler doesn't respond. Stephanie presses something on his device
then ask again) Tyler your turn is (uses a light pointer to assist
Tyler) your turn is?
Tyler: I'm finished
Stephanie: Good
Tyler: I'm finished.

Stephanie is now checking the individual work that Kai was doing while she
worked one on one with Tyler. Kai was to match words with pictures.
Stephanie: (reads the words out loud) Stop, out, women's restroom or girls, fire,
exit, oops you need to try these two again. (explains the differences) Look this
one is danger the one with the triangle and yellow. And this one is poison all right
poison is the X (referring to the icon for danger). In, danger, boy, and bus. Good
job Kai, very well. (Field notes 05/21/01)
This exchange demonstrated the commitment to encourage the use of the device. The lesson was centered on communication and usage of the device. The lesson was used with both nonverbal and verbal students. However, there was no social interaction occurring between the students. The activity was very individual, one on one work although the students are sitting together. The students do not interact thereby limiting opportunities to negotiate and further develop language. The language was also restricted to that which was decided upon by the prescribed reading assignments.

Effective Collaboration

The teachers in this setting were familiar and comfortable with the devices. They worked collaboratively with the speech pathologist and their aids interaction reflected the teachers' leadership. The teachers and the speech pathologist valued the use of the device and the explicit teaching of communication skills thus; it was manifest in all activities. Even the students' attitude towards communicating with other students and the importance of alternative forms of communication reflected leadership.

For example, during one observation in which I was watching a group of students go over their weekend sheets with Joy, one of the verbal students asked one of the nonverbal students a question which presented two options for an answer. The teachers would use this technique in which they would hold out their hands and use them to symbolize answers for example sticking out the right and saying “Did you eat ice cream?” and then sticking out the left hand for “Did you eat cookies?” If the student touched the right hand, then, the student ate ice cream. If he touched the left hand, then,
he ate cookies. This exchanged illustrated the effectiveness of models by the
teacher/student interactions. This is an example of how the teacher/student interactions
not only teach the nonverbal student how to communicate, but it also teaches the verbal
student how to communicate with the nonverbal student.

Collaboration was an integral part of this setting. All staff worked together and
exchanged ideas freely. Responsibility for ensuring that the students’ academic and
social needs were met was everyone’s. The teachers did not wait for the speech
pathologist to make changes to the device. They did not leave the knowledge and the
care of the device to the speech pathologist, but took personal interest in knowing the
device and how to integrate it into the curriculum.

Effective teaching styles

In this case, the students were explicitly taught the functions and the use of
language in a variety of settings. The device was used consistently and systematically to
encourage and develop the communication of all students in the classroom. The
literature on the development of language talks about the reciprocal nature of verbal
interaction and language development. The literature review also discusses the
relationship between language and cognition. However, the increased verbal interactions
of these students have not changed their cognitive status in the school. These students
remain cognitively low and are taught accordingly. Joy, the speech pathologist,
facilitated this particular activity.

Joy: How are you going to pay? How much
Brian: one dollar
Quentin: fifty-four cents
(Brian raises his hand)
Joy: Yes Brian.

Brian: My turn, I riding on the school bus (device)

Joy: You are riding on the school bus that is how you are going to get there. (Joy is talking to Carol asking if she is ready to go. At the same time Brian is pointing at the device trying to get Quentin to say something. Joy is walking back and forth in front of them holds their mother's day cards.)

Quentin:

Joy: Post office lets mail it

Brian: We are going to mail it that's right

Joy: Mail it

(Quentin begins to say something but changes his mind.)

Brian: utters something

Joy: Yes, Brian – mail what?

Brian: I would like one 34-cent stamp, please

Joy: That's right you need a stamp, but what are you mailing? (Christian makes hand movements to represent keep going)

Joy: That's right keep going

(Brian is still waving cards in front of them.)

Joy: I need my address label, please

Brian: You know what? Your address label is already on it.

Joy: What is this? (Shows them the cards) (Brian is still making gestures to keep trying; they are both looking at the device)

Joy: That is right keep going. (They are making selections on the device)

Brian: Card store

Joy: That's right but what do you need? (Quentin begins to say something but changes his mind.) Brian shakes his head to say he doesn't know. Points at mother's day card on device but don't say it.

Joy: Yes (Joy confirms for him)

Brian: Mother day card

Joy: That is right you need your card. (Joy stand in front of Brian with two cards.)

Brian: Brian utters something and points at Quentin.

Joy: Which one is yours? (Brian points to the wrong card)

Joy: Your name is Quentin?

Brian: Brian utters something and points at Quentin.

Joy: That's right that's his, which one is yours? (Brian points to his, Joy hands him the card. Joy then stands in front of Quentin and waits.)
Quentin: Mother's day card
Joy: Ok, which one do you need?
(Quentin selects his own.) (Field notes 05/09/01)

In order for them to achieve this, learning took place in many different settings, For example, at the post office and Target during my observations.

(Brian is at the post office. The students go through the line while the staffs stay back and watch. Brian is the first in line; he places his device on the counter)

Brian: I would like one 34-cent stamp, please.
Cashier: hands Brian one stamp. That will be 34 cents.
Brian: Thank you (Brian gets the money out of his wallet and hands it to the cashier, holds wallet open to wait for change.)

Cashier: 36 cents is your change do you want your receipt?
Brian: with out device says, yea, utters something that sounds like all done.

The cashier wave’s bye as Brian walks away. Brian then hands the device to Quentin who is next in line. (Field notes 05/09/01)

Joy explained that this provided the students with the chance to practice communicating and using their devices in real life situations as well as educating the community on how to respond.

While at Target, the students used their devices to practice some math skills. Then, they used the device to communicate with the checkout clerk. Joy and the other staff did not interfere unless it was absolutely necessary to do so.

Back in class during weekend sheet activity the students shared what they did over the weekend. There were four students participating in this classroom activity. Two of them were verbal and two used an AAC device. Brian and Quentin continued to share one device. Quentin’s device was not working at the time of the observation. The students were sitting in the front of the classroom in a row facing the chalkboard. The
device had been placed on an extra chair in-between the two students. During this activity the students practiced communication as well writing and reading. I was told that the teacher added the academic component. The academic component is the addition of writing and reading. In this class, unlike the middle school and the elementary school the teacher was facilitating this activity. Usually it was done by the speech pathologist, but her schedule did not meet the needs of the students this year. The teacher volunteered to conduct the activity. This was evidence of the collaborative and the shared responsibility towards teaching communication. At the other schools, the activity was used for communication. In the classroom, I observed the students doing weekend sheets. It was interesting because during the time in the classroom, I realized that Brian and Quentin demonstrated behaviors that contradicted the interviewers’ description of AAC users as being passive by nature. For example during the class section in which the students were discussing their weekends I was sitting in the back of the classroom videotaping the class session. Once the teacher had gone through each of the student’s weekend activities Brian turned to me and asked “What did you do this weekend?” and “who were you with?” He initiated the questions. Another example was that Quentin was eager to respond and talk by using the device. At one point, Carol had to tell him to wait for his turn. This is different from the way in which the elementary TA and special education teacher responded by talking out of turn. At the elementary school, the TA and the teachers they would take away the device. At the high school the students corrected and taught the proper behavior of turn taking. This is what Delpit (1995) meant by teaching the codes of the dominant culture.
In this setting, the teachers were involved and played a very instrumental role in the acquisition and maintenance of the devices. The teachers were capable of making changes without the assistance of the speech pathologist. They and the speech pathologist as well as the other staff members worked collaboratively and considered communication as everyone’s responsibility to teach. It was incorporated in all the activities.

For the students in the TMD classrooms the classroom structure, practices and routines all served to improve the communication skills of the students. A list of characteristics that create an environment that enables AAC students to use their devices to mediate their language is provided in chapter 6.

Summary

This section demonstrated that explicit teaching of communication skills increased the opportunities for AAC devices to be implemented and used in a variety of meaningful social interactions. This seemed to require that the devices be accessible to the students at all times. The expectation and requirement in the latter two case examples was that the students were responsible for having their devices with them. In the first case examples, the device was used if it was available but was not encouraged when it was not.

The most obvious difference in this setting was the teacher’s orientation to the device. In the latter examples, the goals in the classroom were clear. In all that they did, the primary objective was to help the students to become better communicators. Thus, the curriculum and materials reflected this goal. However, in the first case examples, the
goal was not clear and the curriculum and material usage reflected the lack of clarity on the purpose of education for these students. The teacher’s orientation in this environment relegates the responsibility of developing the communication competency of the student to the speech pathologist.

It is important to note that the two case examples represented a different academic level of students. In the first case example, the students were categorized as “educable”. Unfortunately, this was not evident in the curriculum activities presented in the classroom. Communication was a small portion of the students’ goals that was handled by someone other than the teacher. The teachers in the first case had limited interaction with the students and did not work with the device.

This chapter presented case examples of the impact different social environments had on the communication development of the student. Chapter 4 discussed the barriers to inclusion and AAC implementation and usage. This chapter used those barriers to present two types of environments - one that supports and encourages communication development by providing communication-based instruction and one that disables the use of AAC by assuming communication ability. In considering the difference with in these cases the teaching styles, collaboration, access to the device, passivity were considered. Although the disability plays a major role in the students’ limited ability to communicate, it is the teachers’ actions in the classroom that were most influential in the use of the devices as a communication and learning tool. This chapter not only demonstrates that language instruction must be explicitly taught, but it also demonstrates that the device itself must be taught as well. The case examples provided a picture of what it was like in both the classroom setting that focused on communication and the one that assumed
communication. The key problem that the data suggested in this chapter was that student’s limited access was related to the communication assumptions and the teacher’s explicit teaching of communication skills.

More specific to research question number 6 where I ask, “How do AAC impact ways of talking, interacting and communicating?” the discussion in this chapter is linked back to Delpit (1995) discussion about appropriate ways of interacting in order to be successful in a particular environment. Imperative to appropriate ways of interacting is the explicit instruction in the normalized knowledge of the school. Chapter 6 further expounds on the impact of AAC and the influence of the teachers implementation on the potential of AAC technology to mediate both communication and learning in the classroom.
CHAPTER 6

EXCLUSIONARY PRACTICES WITHIN INCLUSIONARY ENVIRONMENTS:
CONCLUSIONS AND RECOMMENDATIONS

Introduction

Throughout this dissertation, I have set forth social construction and social interaction as the foundation and basis for the inquiry. The purpose of the study was to explore the process of implementing AAC technology in the classroom. However, the study’s central findings illuminated the ways in which the impact of the AAC device and the experience of the AAC user are dependent on the social environment of the classroom. The ability of the AAC device to serve as a language mediation tool was demonstrated in chapter 5; yet, the data presented here suggests that it is limited by the social and political structures with which it is expected to interact. The social environment of the classroom determines the student’s ability to master the use of the device and also the extent of its use in the classroom. Throughout the study it has been observed that the nonverbal student’s interaction with the teacher and the teacher’s interactions with the device correlate with the student’s level of mastery of Augmentative Alternative Communication in the educational process of the student.
I situated the study within the discourse of language and technology in the schooling process. I discussed how the social practices of the school environment were problematic for children who did not meet the 'normal' standards for general education. In particular, I discussed how nonverbal children relied on the use of materials and equipment to aid them in their inclusion, as well as on the acceptance of their difference(s) by the authority figures in their schools. As indicated in chapter 2, the literature asserts that in order for children to learn language and how to use it, they must be able to participate in the social interaction process that helps them develop language. The finding asserts that language must be mediated because of their limited verbal abilities, but the social environment of the education must change to accept the differences in the language systems, which these children learn to use.

The study was motivated by my interest to understand more fully AAC technology and the impact it has on the education process for nonverbal students using AAC devices in the classroom. The study originated in an adaptive technology course in which I was introduced to various technologies that could assist persons with disabilities lead more independent lives. From this introduction, I began to question the implications of AAC technology for children who are in school, in particular, students who are preliterate and prewriting.

The study was designed as a multi-site case study in order to understand the benefits and the limitations of AAC in a variety of settings. In 2000-2001, many inconsistencies were present across the cases. For example, in the elementary school the students used their devices generally when the speech pathologist was present, whereas at
the middle and high schools, the devices were used during all academic activities. Due to inconsistencies, some students were more likely to be excluded not only from general education classrooms but also from participating in the various activities in the special education classrooms as well. Another instance of the inconsistency is the fact that there are no general guidelines as to how to approach the continued implementation of AAC devices.

Staff appropriately regarded Joy, the speech pathologist, as the informal AAC technology specialist. In the absence of any clear guidelines and direction of AAC, the district looked to Joy as the authority in this area. The teachers and speech pathologists knew that the use of AAC technology was not widespread in the district; they and thus generally did what they felt comfortable with; the result that students were not given equal opportunities.

In this chapter, I summarize the initial findings that were reported in previous chapters. The impact of the AAC device and the experience of the AAC user depended on the social environment in which the students were placed. Major themes that emerged from the data were (1) the social acceptance of the student and the device, (2) power of the authority figures in the classroom, (3) and the importance of explicitly teaching not only how to use the device.

Original research question as framework of summary

The findings can be said to summarize the impact of AAC technology in the schooling experience of its users. Returning to the original research questions provides a framework for this summary.
How do teachers perceive and use AAC technology in the classroom?

The data suggest that teachers in this district implemented the technology based on their own personal orientation towards explicit instruction of communication skills. In those classrooms where communication skills were explicitly taught AAC technology was use most effectively. In those classes where communication was not explicitly taught AAC technology was used minimally, in most cases it was used if someone else mentioned it or the student initiated the usage. The way technology is viewed is represented in the way it is implemented with in curriculum of the classroom instruction.

How does AAC supplant language impairment?

AAC does not ameliorate language impairment. It supplements speech in the hope of improving language development. AAC devices offer an alternative linguistic system for persons who are limited in the “natural” system. The AAC linguistic system is made up of an iconic input that is translated into a computer system that converts the selection to voice output. The voice output can be in the form of recorded human voice or synthetic computer generated voice. Providing the nonverbal students with a communication system increases their chances of developing language; in turn, this has the potential to improve their social interaction. However, the development of language is not a linear process but a circular one, which depends on speech, social interaction, and language development itself. Simply put, AAC provides the potential to improve the language of its users.
It is as simple as this gives them speech. I have found that so many kids have a language base in their heads. So many kids have recognition of these words; so many kids have an understanding of things they heard that all they’re lacking is the ability of “t”, “s”, “and d”. And all I have to do is give them something that helps them use that “quote” speech and they are able to use the language, which is still in their heads. (Joy, interview 5/23/01)

Joy asserts that nonverbal students do not lack language; they lack the ability to access and use the language that is already in their heads. The excerpt above may lead the reader to believe that providing the student with a device that will replace the absence of their voice will help them socially interact more fully as well as further develop high levels of language which will allow them to participate in more inclusive classroom settings. This same assumption was made in chapter 2, table 2.1. However, the AAC’s ability to supplement communication is dependent on the authority figures in the classroom.

How does AAC technology impact the social interaction necessary for education and language learning?

Given the social perspective in which this study was conducted, it is believed that education is a social process in which learning occurs through social interactions and it is believed that language is the vehicle by which the social process takes place. The literature indicates that a student success in the classroom depends on the student’s ability to participate in appropriate ways (Delpit 1995). Imperative to nonverbal students participation is the access to tools for participation. The verbal student must be able to use language to mediate the classroom communication and learning. For the nonverbal student AAC technology mediate the language.
The focus of this study is on the student who does not have the language tools, particularly voice, readily available to participate in the classroom. The research shows that the AAC technology has the potential to improve the verbal interaction of the nonverbal student in the classroom. However, the interaction is much simpler in theory than it is in practice. The use of technology is reliant on its acceptance in the social environment of the classroom. In this study, verbal social interaction varied with each case. For instance, students at the elementary school using AAC technology did not verbally interact as often as those at the high school did. Although this is not a study of teacher’s acceptance, it becomes obvious that the teacher’s actions play a significant role in the use of the AAC technology in the experience of nonverbal students. It is difficult to determine from this study if AAC has improved the social interaction; but it is clear in those cases where AAC is considered an integral part of the classroom agenda, meaning that where communication skills using the device are explicitly taught, verbal interaction occurs more. However, those interactions are generally limited to teacher/student interactions. The student/student interactions are still limited.

Language literature states that children develop language through meaningful social interactions such as play (Dyson 1992). Yet in this study, AAC has had limited influence on the social interaction of its users. In this study, students with AAC devices did most of their social interaction or verbal interaction with the adults in the classroom who understood how to encourage the use of AAC. Joy explains that the students are passive communicators and thus communicate with people with whom they feel safe.
Because we are safe, I truly believe because number one we are safe and we follow all the rules. We follow all the communication rules we’re safe we respond to them. We do everything they need. We fill in their blanks, we infer, we repeat back we do everything they need to make them successful communicators so we are the first ones they go to (Joy, Interview 5/23/01)

Although these students are considered passive by nature, there are some instances where this is contradicted such as in the case of Maya. During my observations, Maya’s use of the device was limited. She knew how to use the device, but I never saw her seek out the device to use. Maya was only a passive communicator when considering the device. She tried to communicate more with her voice and through nonverbal methods such as gestures.

The data also suggest that the students may have likely been socialized to be passive. Joy inadvertently suggest this when she told me:

I know, see there is some funky thing that happens when you’re not verbal. I swear there is something that happen between birth and 3 when normal kids are interacting with the adults and getting their attention whatever I don’t know because it is nonverbal those parents stops reading those cues and you have to read those nonverbal cues. You know you are bouncing a kid on your knee and you stop and the kid goes like this again. (Makes the gesture that the kids is bouncing) he’s telling you more, well if you don’t acknowledge that and so oh you want more and bounces him again (Joy, interview 05/23/01)

It is assumed that AAC would improve the verbal interaction, which will improve language and thus generate more social interaction. However, social interaction and the impact of AAC rely on more than just using the tools. It is constrained by the social
relations such as the environment, the curriculum, and the perceptions and ideologies of the teachers and speech pathologist. The potential of the AAC device cannot be realized outside the vision of the stakeholders, mainly those who are “in the trenches” who are expected to teach with these devices. Thus, the teachers’ influence as an “on the ground policymaker” shapes the actions of those in the classroom.

How does AAC technology impact the practice of inclusion?

Beyond providing a mechanism for nonverbal students to communicate verbally and to learn, AAC does not directly impact the practices of inclusion. The introduction of AAC has not increased the number of nonverbal students in the general education classroom; nor has the study demonstrated that there was an improvement in the cognitive ability of students. Although language is associated with thinking, only one student is placed in the regular classroom. However, the inclusion of this student was not related to the use of the device; he was included because it was the request of his parent.

The limited ability to speak is not the only reason why AAC users are not being included in general classrooms. The inclusion of these students depend a great deal on the knowledge and beliefs that shape the practice of educating students with disabilities in the classroom. It has much to do with the way in which the cognitive levels of the students are perceived.

The primary goal of AAC is to improve the ability of students to communicate daily needs. It seems that the professionals believe the device would be able to improve the students’ status. It is not an expectation that the device will help the students to move
into higher levels of learning. In fact, it was stated and believed by Joy that some of the students’ status would diminish. They should have been in lower levels in the first place and that at early ages; they were able to keep up with their age group because not much was expected (Joy, field notes, 07/19/02).

Researcher: but he’s educable, right?
Joy: he’s labeled as educable, but I don’t think he will be the next time he is tested, because I have not seen the rate of learning. There something that tells you when they come out of early childhood your 5 and 6 and the things you have to know by 5 and 6 aren’t a whole lot so you know your pretty close, but by the time you’re retested at 9 think what a 4th grader knows? There is no way he knows all his color words yet?

Researcher: How much of that do you think is because of his disability and how much of it do you think is because the teacher thinks he can’t learn so they limit what they give him?
Joy: I think it’s uh. Chris never limits what she tries to teach them. That’s why I have to think its cognition. Because she has two other students who are kindergarten kids in her class right now who has gone through all the upper case and lower case who have gone through all the sound of the alphabet have a basic sight word and are now working on long vowels and short vowels. Which is the start of the 1st grade? (Joy, Interview 5/23/01)

The other two students that Joy is referring to are verbal students. Ironically, I observed the class to which Joy is referring; the class was working on letter recognition at the time of my observation. During this session, the students were sitting around the table. Taylor was in his chair close to the other students. Each student was given five metal tops with letters on them. They were also given magnetic letters. The assignment was for them to match the lower case magnetic letters with the upper case letters on the metal tops. Apart from handing Taylor the letters, the aid was the one who interacted with him during this activity while the teacher worked with the other students. Taylor
did not match any of the letters. Yet, the aid matched three letters and told the teacher that it was Taylor who matched them. This is problematic because it once again questions whether the problem exists within the child or within the expectations of teachers and helpers.

I assumed that if the students were able to communicate verbally, then, their status would improve. I was under the assumption that with the AAC device, this would be possible. Yet, the previous interview excerpt shows that issues involve much more than providing a device. The relationship of the teacher and the curriculum has much to do with what the student will learn, where, and how. Inclusion is very constitutive of the beliefs held by those in power in the classroom. The teacher has the power to determine the curriculum to which each student has access, which ultimately translates into the future stock of knowledge of the student.

Although inclusion is generally related to issues of placing special needs children in general education classrooms, this study reveals that even in special education classrooms, some students are not always included. In some cases, special education teachers and speech pathologists were just as unsure about the use of the devices in their classrooms as the general education teacher. Moreover, their lack of knowledge or ambivalence about the use of the device, can serve to exclude those very students.

For example, in Stacey’s classroom, all the students are making a birthday card for one of the students, yet Taylor isn’t. As a participant observer, I suggested to the aid that maybe Taylor would like to make a card as well. I asked Taylor if he would like to
make a card. He smiled and shook his head as a nonverbal cue that I interpreted as meaning "Yes". The aid helped Taylor make a card. Taylor's device was not available to him. It was on the aid's desk under some paperwork.

How does the AAC technology impact the academic experience?

The academic experience of the student seems to rely on the authority figures of the classroom. As mentioned previously, AAC has the potential to provide a more rewarding academic experience for nonverbal students. Yet, it will take more than just providing a fix for the student to provide that student with access to the curriculum that has been denied him/her because of the disabilities.

Bruffee (1984) states that knowledge is not located in the minds of the expert but in the conversations. The task of education, then, is to provide the opportunity for students to be able to engage in knowledge producing and maintaining conversations. The social constructionist epistemology sees knowledge as a construction of social interaction (Bruffee 1986). If it were this simple, then, once students were provided a way to interact verbally in conversations, their academic experience would improve so that they could acquire more knowledge. The question then becomes: What is happening?

Language is assumed to be linked to cognitive ability; and thus, the academic expectations of these students are lowered. This means that teachers who considered language as a measure of a student's ability will give the student less work or lower levels of work. The expectations and the beliefs of those in authority once again dictate the academic reality of the nonverbal student. It is not only the beliefs about the
student’s verbal ability but also the student’s cognitive abilities that are in question. Because the student is considered to be cognitively low he/she is taught less. This is problematic because part of the assessment for determining the student’s cognitive ability resides in the student’s verbal ability; yet, once the student’s verbal abilities have been augmented the students cognitive abilities do not change. Why?

Part of this could be in the fact that the student has to be taught explicitly how to use the language and the purpose of language to meet the needs that are determined by mainstream educational paradigms. In addition, Popwitz and Shutkin (1995) explain that the benefits of a tool cannot be realized if the only thing that changes is the material used. The classroom structure and the ideology must change as well. Educator and educational materials assumes that language is intact; thus, explicit teaching of language does not occur. Yet, Delpit (1995) says that if children are not from the cultural background of the mainstream culture of the classroom, they need explicit language instruction. The nonverbal student is a minority in a speaking world without a community of speakers. He/she does not have the models to demonstrate the use of the technology. So, the technology does not have the power to improve the knowledge of the student outside the social world of the classroom. The teacher’s vision and creativity must work outside the traditional educational paradigms that situate students.

In this study, the use of AAC device, for academic activities was limited. I did not observe the use of the devices for academic purposes. I did observe the device being used to count and identify money. I did observe it being used to identify letters and to read words. AAC does not have a direct impact on the academic achievement of its users in this study.
How does the relationship between classroom language conflict or coexist with the AAC linguistic style and design?

Joy believes that the language structure of the classroom conflicts or poses a barrier to the integration of students using AAC devices. The AAC user is characterized by passiveness in the professional view. The students do not generally initiate communication. Because of their passive nature, the typical lecture style of teaching, according to Joy is, not appropriate. Joy explained lecture style as "the teacher asks a question and the students respond." It is also believed that if AAC students are to learn, they should not be in this type of structure. Carol states that social interaction is one of the main reasons for integrating students into regular classrooms; but she, like Joy, explains that the lecture approach to teaching is not conducive to learning for her students. According to Carol, social interaction is important; but in most instances at the high school level, very little social interaction does occur.

"At the high school level there is very little social interaction in the classroom. The teacher is up there and he’s chatting and the students are setting there taking notes trying to stay awake. If we ever move to, if education ever shift the way they teach and it is starting, where it is more interactive and the kids move and they go to labs and they get to move around and play with these things and try to sample these things then there is more room more bases for us to get involved." (Carol, Interview 5/29/01)

Carol believes that at the elementary school level, it is possible to integrate students with devices because it is a more interactive environment. Joy also states consistency is a problem to the successful integration of students. She is referring to the academic switching in the classroom. This makes it difficult to prepare the student to participate in the academic coursework.
"The key is to get the teacher to teach interactively instead of I ask then you respond...it's not so hard with the special education teacher because I pretty much know what her units are and that kind of stuff. And I have stuff she can utilize throughout her day. It is harder when they go out there (Joy, interview 5/23/01)."

This statement contradicts the observational data I saw. In the classes in which Joy believed to be good at using the devices the teachers used the "I ask you respond" with their teaching approach. The scripts in which they followed generally did exactly this. This was also demonstrated in chapter 5 in the reading activity with Stephanie at the middle school.

Joy believes that special education teachers are more predictable than general education teachers. It seems the interviewees consistently believe that the regular classroom setting conflicts with the dynamics of the AAC communication strategy. The key purpose of including students is believed to be the possibility of social interaction.

Yet, as Carol stated, there is little social interaction occurring, anyway. This is an interesting point to note because through my observations, I noticed that there was little social interaction occurring for AAC students in the restrictive environments. What I did notice was that students' interaction with the teacher correlated with the teacher's and speech pathologist's interest in and knowledge of the device.

For example, in the middle school and high school, the teachers make their lessons and activities to explicitly include the student in the activities. The teachers are active in preparing lessons and encouraging communication with the devices whereas in the classrooms where the teacher has little knowledge of or interest in technology he/she has little interaction with the students and the device is randomly used. The responsibility for
the device and its integration is left to the teaching assistant (TA) and/or the speech pathologist. Simply put, the way in which the teacher approaches the use of the device is reflected in the way the student uses the device. Also the way the speech pathologist approaches the implementation of the device is reflected in the way the teacher uses the device and the students' use of it.

All the teachers and speech pathologist seem to believe that the cognitive level of the students limited their ability to participate academically. They believed the purpose of the integration was mainly to provide social interaction. In her interview Joy says to "remember he is probably in their learning communication and its function and conversation, probably not so much the academics at his level of functioning (05/23/02)."

Academic integration of the students does not seem possible. From those interviewed and from my own observation, I gathered that at best, the students might possibly integrate for social interaction. The professionals believe that the cognitive level of the students in this study as well as the communication barriers and the teaching strategy of the regular classroom are reasons for the inability of the students to integrate. Integration is possible, as one teacher explained, simply by the parent's request. It is not the district's philosophy for full inclusion. The district has integrated by including students with disabilities within the same building; however, the district has segregated the difference within the school, based on IQ test scores. Learning Disability (LD), Behavior Disability (BD), Educable Mental Development (EMD), and Trainable Mental Development (TMD) divide the buildings; these are some of the categories that further divide the special education department. Academically, the students have been relegated to a limited academic curriculum. I am speaking specifically about those students who
are EMD and TMD because those are the students I observed and discussed with teachers and others. I was under the impression that EMD students were to follow an academic curriculum with modifications. However, the EMD students seem to be following the same curriculum as the TMD students in some academic areas, for example, math. In every one of the classes that I observed outside the mainstream classroom, the math activities consisted of identifying or using money. Addition, subtraction or any of the math curriculums that are typically used in mainstream classrooms were not practiced during my observations. Although special education espouses work on an individual educational plan (IEP), in general, the students at the elementary school level were being treated as a group. Specific individual needs were not visible as being met.

Even at the elementary school level, integration of nonverbal students it was not all that simple. But this was not limited to the regular classroom. In some instances, it was not even easy to include the student with a verbal disability in the special education classroom. When observing Taylor I noticed that he was marginalized many times. On many occasions, he was left on the periphery of the other students who were clustered in groups according to their age group. Taylor generally was alone with his aide providing most of the attention to him. This was probably because his disability required him to sit in a different type of chair than the rest of the students. Taylor was not an active participant in the special education classroom nor was he active in the mainstream classroom. However, at the upper levels the students were expected to participate. Participation reflected expectations of the professionals.
I had assumed that special education teachers would be more familiar with the verbal disability and thus understand the needs of the various technologies needed to increase participation of the students and the shift in thinking of the students as having a disability that causes the separation, while at the same time taking cognizance of the fact that such a person with disability needs to learn to work with the disability. The study reveals that advocates for students with disabilities and technologies are causing paradigm shifts; yet, those who are in the trenches are not yet in line with the new paradigms that include technology and new expectations. For this reason, we are seeing inconsistency in the instruction and preparation for addressing the issues of educating students with differences.

How do the communicative strategies, ways of interacting, and ways of talking associated with the use of AAC devices facilitate students' participation in the classroom environment?

The communicative strategy of the AAC user is different from that of the traditional classroom. The AAC device takes the guesswork out of what the student thinks. It provides a way for the teacher to assess the student's ability and knowledge. The relationship between the teachers, as the authority figures in the classroom, and the materials, AAC devices, to be used in the curriculum. The teacher has the power to determine if the AAC linguistic system is legitimate. In the general classroom that I observed the device did not facilitate participation. The students participate in limited manner. Much of the interaction in the classroom was restricted to the interaction between the students and the support staff. In the special education environment at the elementary school level, the device received minimal attention and did not improve
participation. AAC did allow the students to talk and interact with those people who felt comfortable with the device. Providing the child with AAC technology did not improve the chances of the child being included in the general classroom nor did it broaden participation.

Conclusions and Recommendations

This study reveals that the social world of the classroom has more impact on the usage and the potential of AAC than the AAC has on the development of the student. The perceptions of teachers and the knowledge that guides their educational practices, conflict with the introduction of AAC communication systems. This study raises questions about the impact AAC and the social environment of the classroom that will need to be addressed in order to understand more fully and take advantage of the potential AAC has to offer students with disabilities. The study suggests the following conclusions and recommendations:

Conclusions

1. Providing students who have verbal impairments with AAC systems seems to give them some control over their environment. Although staff interviewed seemed not to be familiar with critical theories associated with politics of language, they believe the students should have some form of control and that language has the potential to provide the nonverbal student with some control.

2. The degree of collaboration between grade levels and within instructional teams seems to impacts the integration and usage of AAC technology in both the general and special education settings.
3. Interest in communication and AAC technology seemed to impact the integration and the students’ classroom experience with the device.

4. AAC seemed to be most effectively used in those classrooms where communication was a goal in every activity and was explicitly taught.

5. Teachers’ interaction with AAC seemed to reflect the teacher’s knowledge and interest in AAC strategies.

6. The amount of student/teacher interaction seemed to relate with the usage of AAC. Students used devices in situations where they felt comfortable and safe. This mainly occurred among adults.

7. It seemed that students improved their use as they were allowed to practice in meaningful situations. Students in higher grades made more frequently use of AAC technology.

8. The following characteristics of best uses of AAC in this district were identified.

<table>
<thead>
<tr>
<th>CHARACTERISTICS OF BEST PRACTICES IN THIS DISTRICT</th>
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<tr>
<td>2. Communication is primary goal of class.</td>
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<td>3. Teachers/speech pathologists are knowledgeable about devices.</td>
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<td>4. Teachers/speech pathologists are personally interested in communication and devices.</td>
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<td>5. Training is sought by teachers/speech pathologists and is ongoing.</td>
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<td>6. Teachers are able to modify and program device on sight.</td>
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<td>7. Environment is receptive of linguistic differences.</td>
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<td>8. Students are part of the class (physically and by participating).</td>
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<td>9. All who service AAC students in the classroom use shared strategies.</td>
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<td>10. Teachers/speech pathologists provide leadership for the other staff in the classroom environment.</td>
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<td>11. Access to communication is never denied.</td>
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<td>12. The function of language is emphasized.</td>
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<td>13. Clear vision of the usage, goal, and expectation.</td>
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Table 6.1 Characteristics of best practices
9. The competencies of students and teachers must be redefined in order to incorporate technologies that were not originally intended to augment classroom practices. The introduction of AAC must be more than material changes in the classroom. It must go beyond adding strategy to the existing schooling practices of including students with verbal disabilities. The potential of AAC relies on the alterations of categories, distinction, differences for interpreting and effecting practices of educating students with disabilities (Popkewitz and Shutkin 1995).

Recommendations for Field Practices

Based upon data from this study, recommendations for the field practice in AAC technology were made. It is recommended that efforts be made to:

1. Consider the time frame in which the student is mainstreamed into general classrooms. Relationship building with subsequent teachers prior to the beginning of the year should be carried out. Missing the beginning of the class in which the students are meeting and learning their classmates and the classroom structure might have an impact on the inclusion of the students as members of the classroom.

2. Reconsider placing students with teachers and speech pathologists that do not understand the communication needs prescribed for the students. Consistency would serve the student better. There are too many gaps in the learning process.
for AAC users. Woll & Barnett (1996) indicate that this inconsistency in the state of learning is due to the changes of systems and environments, which cause a loss in language development, and sustaining what is previously learned. The discontinuity in this study raises questions about communication and growth for the individual.

3. Collaborative efforts need to be better defined and carried out in order to meet the diverse needs of the students. Collaboration should not be viewed as simply requesting a student to spend some time in the general classroom nor should it be simply an agreement for the student to be pulled out. Collaboration requires parity, mutual goals, shared responsibility, decision-making, and accountability for outcomes (Friend and Cook 1992).

4. An assessment of teachers’ knowledge base of AAC technology and linguistic strategies should be conducted before nonverbal AAC users are placed in classrooms. This assessment should be done on regular education and special education personnel. This reflects Villegas (1991) suggestion that teachers must be sensitive to the cultural characteristic of the learner and have the skills to accommodate these characteristics in the classroom.

5. Examine factors associated with AAC students’ inclusion and the challenges that confront both the special education and general education teacher, and to determine content for in-service training and implementation at each level for each unique school environment.
Recommendations for Future Research

Based upon data from the present study, the following recommendations are posited for future research:

1. The study should be replicated to identify teachers/speech pathologists’ perceptions of AAC technology as a linguistic strategy.

2. The study should be replicated in other states to obtain a national view of best practices and usage of AAC technology in the classroom.

3. Having identified characteristics and beliefs of effective AAC usage and practitioners, the question concerning how to develop these characteristics and beliefs in other teachers remains. When one speaks of developing certain characteristics, one automatically addresses a continuing receptivity to growth.

4. This study only hinted at the power relation of the designers over the use of the technology. Delpit (1995) explains that the teacher has power over the student, and that the curriculum developers have power over what is taught. I interject that the designers of AAC devices have power over the students’ ability to communicate and learn because the structure of the device dictates its uses. Therefore it is not just the individual’s condition that dictates his situation but it is the innumerable social relations and ideologies that situate the student. Delpit (1995) states that the process of schooling, which is a juxtaposition of all the possible power relations, is intimately related to the power that determines the
future economic and social state of an individual. Delpit (1995) indicates that power is enacted in the classroom. Future research should include the social construction of AAC technology from the designer's perspective and its relationship with the users' educational experience.

5. The study was limited to a select group of students none of whom were totally engaged in academic activities. Future studies should look at the implementation of the devices for students who are in true inclusion programs.

6. Extend the study over a longer time frame. This study occurred over three-month period. Some changes had occurred with one of the speech pathologist, and it is impossible to know the changes this made for her students. More time is needed to understand if such changes would be sustained.

7. Include the voice of the student using AAC devices in the understanding of the experience.

8. Study the process of change from one system to another and from one environment to another for the individual. Providing a framework to handle the continuity of change for the students may serve to help the student to sustain previous learned language development.

9. Study the effects of students' differences such as race, ethnicity, and gender. The teachers did not consider diversity from a cultural perspective as a factor in the use of AAC technology. When asked questions about diversity interviewees immediately referred to the diversity in ability rather than ethnicity or culture. In the three formal interviews, the interviewees indicated that the disability overrides the cultural differences. While assuming that disability overrides the racial
differences, Carol (interview 05/29/02) believed that it is important to acknowledge the differences. Also, informal conversations with minority aids contradicted the teachers' beliefs. They believed that race and ethnicity played a role in the treatment of the students. The AAC users also have to face the additional challenge of communicating in two environments. The two environments represent that of the disability and the culture the person was born into. Hetzroni and Harris (1996) indicate that the AAC user must learn to function in both environments simultaneously. However, in this study, the dominant linguistic structure of the school is being incorporated into AAC systems.

Summary

The life of a child with a disability is characterized by the paradox of too much schooling but too little education. People with disabilities have had to overcome many social and political obstacles to simply earn the right to be able to attend public schools with non-disabled people. However, simply providing schooling for the child with disability does not ensure that he/she is granted equitable and equal opportunities for education. Physical placement doesn't solve the problem because the problem is more of a sociocultural nature. To break down the foundation that directs children with disabilities into a limited and restrictive schooling process, we must deconstruct and reconstruct sociocultural paradigms that have fostered the standards in which the institution of education determines the knowledge and experience that each student has access to.
The school and the teachers have the power to determine what a student will learn and how that student will learn a particular body of knowledge. Students are presently placed, based on their ability to meet the standards or the norms of the dominant education culture, the general education codes. Gramsci and Foucault refer to such standards as hegemonic and normalizing. Norms and standards are not generally sensitive to differences. The social process of education implies that learning takes place within a larger context (the society) that entails differential status for different classes, ethnic or cultural groups as well as purposes for schooling that reflect practices and goals of the dominant groups. This includes what is taught, how it is taught, how students are allowed to participate, and how students are expected to learn (Estrin 1993).

They also place a higher value on the sociocultural capital of one group over another. In the United States, it is the culture of the dominant society—generally, abled-bodied white middle class males. In this case, it is the culture of the able-disabled over the culture of disabled, specifically those disabilities that require the spoken form of language to be supplemented.

In the United States education system, standards are constantly being added. Standards are being raised with the view to improve the status of the U.S. educated masses. Ironically, the result is contrary to expectation. What must be recognized is that there is a direct positive correlation between the raising of standards and the increase in the number of students with disabilities. For example, if English is a standard, then, children who speak French are considered to have a deficit and are educated or schooled on a deficit model. If the standard is that students must be able to communicate orally
then, students who cannot are considered disabled. Students who do not meet the norms of the schooling process are at risk of not being educated but being simply schooled, meaning that they enter or leave a building and run through some activities to pass the day and go home just to repeat the process again the next day. There is no hope that they would achieve any higher order of knowledge so, none is presented because of the paradigm in which those who are trained to educate prescribe to.

In order to educate children who do not meet the standards, the system must be sensitive and knowledgeable about the difference not as a deficit but as a different approach. The difference must be used in order to reach the standards. That is not to say that the standards should be compromised, but that there should be alternative methods, which recognize and honor the difference while trying to achieve common goals. Instead, today's children of differences are expected to fail because they have a different perspective of the world or that they have biological differences. Or they are simply excluded from participating. Delpit (1995) indicates that education needs to be explicitly thought about as connecting disadvantaged students with the "culture of power. Without such connections, the inabilities to see beyond the traditionally taken-for-granted assumptions of education create a disabled system for disabled students.

Children with verbal disabilities are not for the most part expected to achieve at the levels of their verbally able peers. Why? Many reasons can be attributed to this.

- Verbal ability is translated into cognitive ability.
- During early childhood education, verbal ability is the primary tool of communication and learning.
- It is difficult to teach a child to read, write, and communicate when that child cannot speak. So the problem becomes the child and not the system.
- It requires creativity and innovation to teach a child with verbal disabilities.
- A child with a verbal disability requires explicit lessons in how to communicate, however, communication is rarely explicitly taught in schools.

These are just a few of the possible reasons that pose problems for the student with a verbal disability and constitute the reality of experience for the nonverbal student.

Educators must begin to realize that what students with disabilities do not learn is not necessarily a direct result of the biological disability but an indirect result of what is thought of that disability. If the system continues to operate according to assumptions that believe that speech ability indicates cognitive ability, then, verbally impaired students will be limited in their access to higher levels of learning especially if the social environment does not change to work with the disability. Students who are currently labeled as educable will continue to decrease in IQ because they will not have the access to the knowledge that will help them maintain their current standing. Unfortunately, the phenomenon is associated with the disability instead of with the sociocultural educational paradigms that accompany the disability.

So how is it too much schooling? Children with disabilities have the potential to attend school for longer periods than their able-bodied peers; yet, they come out learning less. What is the purpose of putting these children through all of this schooling? What is the purpose of spending money on expensive equipment if the child is not going to be able to use it in any environment, particularly with people they are not familiar with or
those who are not familiar with them? Is the system paralyzed by its inability to see
outside the traditional paradigms? Is the system disabling innovative teachers by its
traditional paradigms and theories about education and the child with differences? Are we
creating disabling environments for disabled children?

Paradoxical issues of educating the nonverbal student with AAC technology (i.e. who
will teach AAC, how, when, at what cost and for what?) force us to look at school
practices and examine the relationship of language, technology, and the classroom in the
experience of the nonverbal students. As Crawford (2000) tells us, “Language is par
excellence, the medium for social construction of both social and physical realities”; and
Popkewitz & Shutkin (1995) tell us technologies of cognition such as AAC are systems
of regulating the individual. For this reason, we are reminded that while the future of
educating students will no doubt use technologies; how we use those tools will definitely
impact the educational opportunities and future realities afforded all students, specifically
students with special needs.
Academic status refers to the different placement levels that are represented in this study such as regular education, EMD and TMD.

Augmentative and Alternative Communication technology in this study refers to computer base communication aides that supplant speech for nonspeaking persons. This distinction is being made because AAC can simply be a picture book.

Inclusion according to Wright (1999), "means teaching all students in a regular education classroom, at their hometown school, with their age and grade peers, for the whole day with support services provided in that classroom (12)." In this study I refer to anytime spent in the general education classroom as inclusion. I also refer to participation in the classroom activities whether in general or special education classrooms as inclusion.

"Culture of Power" this is defined by Lisa Delpit (1995) as the culture which has the power to determine the norms of an institution.

Communication-based instruction Joy defines communication-based instruction as instruction that explicitly seeks to improve the communication competency of the student by incorporating the development of communication skills within all of the activities in and out of the classroom. Communication is a priority within the type of instruction.
World knowledge is the general background in which they can relate to issues of science and social studies (Stephanie, interview 05/23/02)
APPENDIX A

LETTER OF INTRODUCTION/CONSENT FORM
Dear Teacher,

I am a Doctoral student in the School of Policy and Leadership at the Ohio State University in Columbus, Ohio. As part of my requirements I am conducting a research project about the experiences of AAC use in the classroom. I am interested in exploring the impact Augmentative Alternative Communication devices have on the education process of non-verbal students.

Your participation will include observations during the regular classroom time and possibly a 30-minute interview. With your permission all observations and interviews will be videotaped or audio taped.

Your identity and comments will be confidential in all discussions and reports of this study. To maintain confidentiality pseudonyms for your name and school will be used. In addition you are invited to participate in the analysis of the data collected.

The videotapes will be used as field notes for my research and brief segments may be used for conferences. You will have opportunity to preview segments. You have the right to withdraw from the study any time prior to the final submission of the dissertation.

This study will be shared with my dissertation committee and other appropriate members of the Ohio State University in Columbus, Ohio. The dissertation that results from this work will be published in hard copy and microfiche, which will be housed at the Ohio State University Campus.

Attached you will find a consent form in which I will need your signature for approval to use information collected as part of the study as well as permission to videotape during observations. Please sign the appropriate forms in the presence of a witness who must also sign the form as a witness. Please return the form to me, or Lisa Bova.

I appreciate the time you will give to this study, which will help me learn more about the impact of AAC in the classroom. If you have any questions, please feel free to call me at (309) 452-9179 or email at Mwilambwe.1@osu.edu. You may also contact my faculty advisor, Dr. Suzanne Damarin at (614) 292-7845 or Damarin.1@osu.edu.

Thank you,

Marsha Mwilambwe
CONSENT FOR PARTICIPATION IN SOCIAL AND BEHAVIORAL RESEARCH

I, ______________________, agree to participate in research entitled: giving voice to the silent: Augmentative Alternative Communication technology, language and the classroom. I, ______________________, also consent to the video tapping of the observations in my classroom.

Dr. Suzanne Damarin’s authorized representative, Marsha Mwilambwe, has explained the purpose of the study, the procedures to be followed, and the expected duration of participation. Possible benefits of the study have been described, as have alternative procedures, if such procedures are applicable and available.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw consent at any time and to discontinue participation in the study without prejudice to me.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily.

Signed: ______________________

(Participant)

Witness: ______________________

Principal Investigator: ______________________
APPENDIX B

DEMOGRAPHICS STUDENTS USING NON-VERBAL STUDENTS IN THE DISTRICT

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Information provided compiled by Lisa Bova, Speech pathologist. 10-18-01
26 students who are nonverbal
21 are male
5 are female
12 are severe and profound
8 are trainable
6 are educable (at least at the time of your research - I bet they will test TMD in the future years)
elementary 14
middle school 5
high school 7

<table>
<thead>
<tr>
<th>Non-Verbal Students in District (26) 2000-2001 School Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMD (6)</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>DV</td>
</tr>
<tr>
<td>Elementary</td>
</tr>
<tr>
<td>Middle</td>
</tr>
<tr>
<td>High</td>
</tr>
</tbody>
</table>

Note: DV- student uses a device   NDV- student doesn't have a device
Note: S/P students use battery ran elementary devices (1, 2, or 8 squares). The shaded area represent the students who were not apart of my study.
Community Prep Script – Grocery Shopping

Teacher- (holding community book in front of class)

“It’s time for __________ (pause)”

Student – “Community”

Student locates correct section in personal communication book.

Student points to picture on community book.

Teacher (holding sentence strip)

“I am going to (Target)”

Student- “I’m going to the mall” while point to icon in community book

“I go to mall” while using personal communication book (PCB)

Student matches logos

Teacher – Prompt 1 (waving list) pause

Prompt 2” what are we looking for? “ (waving list)

Student – “I need list” using PCB if necessary

READ LIST WITH TEACHER

Teacher – “Where does it go?”

Student – “List in fanny pack” using PCB if necessary

Student – puts list in fanny pack or puts picture on clipboard.

Teach – Prompt 1 (holding calculators) pause

Prompt 2”How much will we spend?”

Student – “I need calculator.” Using PCB if necessary

Point to calculator
Teacher – Prompt 1 (Waving money) pause

Prompt 2 “How will we buy it?” (while waving money)

Student – “I need money” using PCB if necessary

Point to money

COUNT MONEY

Teacher – Prompt 1 “Where do we keep money?”

Student – “Ride in _________ (Van, bus, etc.) using PCB if necessary

Point to picture

Teacher – “Ooooh! It’s cold outside!

Student – “I need coat” using PCB if necessary
Sometimes friends leave.
sad

This make me sad.
no more seeing you
This make me sad
no more talking
This make me sad
This makes me happy
I can send you a card.
Goodbye
1. It's hard to say goodbye to a really good friend.

2. When they leave you feel so lonely and sad.

3. But there are things that you can do to make it better.

4. Then you won't feel so bad.
APPENDIX E

COPY OF WEEKEND SHEETS
Name

**Weekend Sheets**

- Places you go.
- People you see.
- What you have to eat.
- What you buy.

**Friday**

- 
- 
- 
- 

**Saturday**

- 
- 
- 
- 

**Sunday**

- 
- 
- 
- 

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Friday

After I got off the bus, I went in and ate supper. After supper we relaxed and spent a quiet evening.

Saturday

Today was a lazy day. I stayed in bed until noon. Then we went to 5:15 pm Mass at Epiphany. We went to Renae’s dance recital after mass.

Sunday

We went mowing! We quit around 4:00 pm. We went to Toluca and ate supper at Capponi’s. We got home around 6:30. Dad mowed our yard. Troy came home later and we went to bed about 10:00 pm.
APPENDIX F

COPY OF WRITTEN QUESTIONS

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1. Tell me about your background. When and where were you educated? When and where did you begin teaching? How long have you been teaching?

2. How would you describe your philosophy of teaching? Your teaching style? What has worked best for you?

3. How have you handled the diversity in your classroom?

4. What types of technology have you used in your classroom? What are the main purposes you have used the computers in your classroom? How often do integrate technology in your daily activities?

5. In your opinion what is the primary goal of including non-verbal children in the regular classroom? How effective have you found this to be?

6. Given the communication structure of your classroom, how has the Augmentative device assisted with the inclusion of the non-verbal student?

7. What kinds of things have you done in the classroom that has facilitated the academic success of non-verbal AAC users? What preparation and adjustments did you have to make?

8. How much of what you know about teaching non-verbal AAC users did you learn as a result of teacher training either pre-service or in-service? Where do you go when you need assistance or have questions about AAC?

9. In your opinion what is the primary role of the regular and special ed. Teacher, the teaching assistant, and the speech pathologist when serving the non-verbal student?

10. What role do you believe parents play in the success of non-verbal AAC? How would you describe the kinds of relationships you've had with parents of students you taught?

11. What was the most difficult part about including non-verbal AAC users in academic activities of the classroom? How did you address this?

12. How do you go about assessing the academic and social progress of the nonverbal AAC users? What standards are they held to? How do you assess the non-verbal
13. AAC users performance: How does language impact on your assessment? How does the device impact on your assessment?

14. How do you think the schooling experience of the non-verbal students you teach differs from that of verbal students?

15. How would you describe your overall experience of working with non-verbal AAC users?
APPENDIX G

OVERLAY SAMPLES
APPENDIX H

CLASSROOM ACTIVITIES OBSERVED
This is a list of the academic activities in which I observed the students. Within these observations AAC devices were considered as they were used in these activities.

The table outlines specific activities that were observed it doesn’t include free times and transitional moments. Although EMD and students in general classrooms were considered cognitively higher than those students in the TMD classrooms, they used the device the least.
REFERENCE


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