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Augmentative and Alternative Communication Systems in the Classroom

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Walden University
2011

Abstract

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MS, Columbia University Teachers College, 1988

BA, University of Connecticut, 1986

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Special Education

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Abstract

Augmentative-alternative communication (AAC) systems are used to give voice to individuals who are nonverbal. As AAC systems become more complex and prevalent in the classroom expectations of school-based professionals expand. However, the roles of those expected to support AAC systems, primarily teachers and speech-language pathologists (SLPs), are not clearly defined. Without clearly defined roles, professionals may not provide needed support to students who use AAC. Dewey's theory of community suggests that role confusion leads to insufficient and ineffective services. The purpose of this cross-sectional quantitative study was to determine how teachers and SLPs view their roles in supporting AAC. The key research question examined associations linking the instructional role of the individual to perceptions of who is responsible for implementing and supporting AAC in the classroom. An Internet-based survey, consisting of 21 questions set on a categorical scale, was sent to teachers and SLPs who are members of a technology advocacy and support center located in a mid Atlantic US state. Responses collected through the survey site were analyzed using a chi squared test. Overall findings indicated that the teacher was perceived as primarily responsible to provide support within the classroom; SLPs provided additional support outside of the classroom, such as creation of overlays and vocabulary selection. Assistive technology coordinators also provided support in terms of obtaining the AAC system. In general, leadership changed as support tasks changed. Results of the survey may aid in the development of guidance to support teachers and SLPs working with students who use AAC in the classroom. Improving services for students with AAC needs supports social change by enabling them to use their voice and become more independent.

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Acknowledgments

To the all the teachers, therapists and the staff of the technology support center: Thank-you for your participation in the survey. Together, we can make a difference in the quality of the lives of individuals who rely on augmentative alternative communication. May their voices be heard.

To Annette and Michael Mullarky: Your technical support, Pilates classes, time destressing working on the boat, offerings of adult beverages and everything else you have done to help with this endeavor will not be forgotten.

Most importantly, to my husband Tom Merrick: For all of the cancelled plans, missed dinners and late nights . . . it is finally finished. Now, it is your turn to finish school.

Table of Contents

List of Tables

Chapter 1: Introduction

The technology available in schools to students, teachers, therapists and educational staff continues to expand. This expansion in turn increases the expectations of parents and students regarding the skills and knowledge of teachers and school-based therapists. In particular, parents and caregivers of children who are nonverbal may be encouraged to seek alternate means of communication for their children. As the field of augmentative-alternative communication (AAC) grows to give a voice to these students, systems may become more technologically complex, more readily available to students and more prevalent in the classroom.

The American Speech-Language Hearing Association (ASHA) provides guidance to speech-language pathologists regarding their scope of practice and professional responsibilities. In 2005 ASHA updated and published a position statement regarding the roles of SLPs in the obtainment, support and implementation of AAC across the lifespan of the individual who uses AAC. Service provision in the home, schools, nursing facilities and other locations was identified as one of the roles of an appropriately trained SLP. The ASHA statement includes clearly defined skills and competencies necessary for SLPs to provide effective AAC services, but lacks clearly defined skills and competencies for other professionals, including teachers.

The National Joint Committee for the Communication Needs of Persons with Severe Disabilities was formed to address the various needs of individuals with severe communication impairments. In 1992 this committee established guidelines and

parameters for communicative interactions with individuals with disabilities. Among these guidelines is an emphasis on the need for all individuals who interact with a person who is nonverbal, to engage that person appropriately, with dignity and in a manner comprehensible to that person. It further indicates that all communication partners need to learn to understand the various means of communication that may be utilized by an individual who is nonverbal. This need extends across all environments, including schools.

The two position statements have been used as guides for the implementation of AAC services. The need for all individuals who work with, interact with or teach an individual who uses AAC to learn the basics of the AAC system have been highlighted in these position statements. The need for team effort, especially in the schools, has also been emphasized in these statements. However, in spite of this focus, a review of the literature resulted in only 25 peer-reviewed articles pertaining to the use and support of AAC in the classroom. Although Locke and Mirenda (1992, p. 209) identified areas for further study, including identifying "what AAC roles and responsibilities are actually assumed by other professionals on the team," there has been little published research in this area.

SLPs and teachers may be required to use AAC devices with students who are unable to speak. These devices may range from producing a single message to complex sentences, allowing the students to communicate and demonstrate learning. However, there is anecdotal information that devices are not being used consistently in classrooms (Johnson, Inglebret, Jones, & Ray 2006; Johnston, Reichle, & Evans, 2004; Starble,

Hutchins, Favro, Prelock, & Bitner, 2005). Part of the problem is that although position statements have been issued, the roles of SLPs and teachers are not defined within schools and these professionals may not be receiving adequate training to fulfill roles.

Studies (Johnson, et al., 2006; Jung, 2007; Kent-Walsh & Light, 2003) have indicated that teachers and SLPs do not know who is responsible for various aspects related to the use AAC devices. Each professional may believe that AAC support is the responsibility of the other or another staff member (Sturm & Clendon, 2004). This lack of training and understanding may contribute to limited device usage by students who may be dependent on AAC to communicate their basic wants, needs, moods, thoughts and ideas. Without consistent availability and use of AAC systems, these students may not be able to demonstrate learning or express discomfort, confusion or comprehension. Essentially, they may be denied access to their voice.

This study fills a gap in the literature by addressing the question of who is responsible for supporting AAC services in the classroom. Current literature primarily addresses the specific needs of the individual who uses AAC, his or her family members, AAC system development and AAC services.

Problem Statement

The problem addressed by this study is that SLPs and teachers do not have clearly defined roles and responsibilities regarding AAC implementation and support in the classroom. It is important to teachers, SLPs and students who use AAC that these roles be defined in order that appropriate classroom supports may be provided to students who

use AAC. The current study contributes to addressing the problem by defining roles and determining if adequate training is provided.

Purpose of the Study

The purpose of this causal-comparative, quantitative study was to determine and then compare the perceived and actual roles and responsibilities of teachers and SLPs regarding the use of communication devices in the classroom. This understanding will lead to the development of teacher and SLP training courses focusing on improved communication device usage, as well as clearly defined roles for implementing communication devices in schools.

One independent variable, professional title (SLP and teacher) was considered in the current study. Previous training, access to continuing education, position statements of professional affiliations and policies of school districts may have been contributing factors to the perceptions of SLPs and teachers. Previous training and length of time providing services may have also been variables in this study; however, they were considered for demographic purposes only. The dependent variables were perception of responsibility and current responsibility regarding AAC support in the classroom.

Nature of the Study

This quantitative, univariate causal-comparitive design study was conducted through a survey. The survey consisted of 21 questions, including a categorical scale distributed via e-mail. Content included background information; however confidentiality was maintained. The purpose of the study was described in an

introductory e-mail which also included a link to the survey. Information based on responses to the survey was analyzed using Cronbach's alpha to establish reliability. Survey validity was established through expert review.

A qualitative study was considered but rejected because although the information collected would provide rich detail, it would not have necessarily addressed the research questions, nor would it have been feasible to gather information from a large variety of people (Bell, 2005; Creswell, 2003; DeMarrais, & Lapan, 2004; Denscombe, 2002; Lankshear, & Knobel, 2004; Mills, 2007).

Other quantitative study designs considered include survey set on Likert scale. Responses set on a Likert-type scale would result in participants indicating the degree of responsibility of each professional, instead of indicating which professional is or should have the final responsibility. Therefore, this type of study was rejected (Bell, 2005; DeMarrais, & Lapan, 2004; Denscombe, 2002; Lankshear, & Knobel, 2004).

Research Questions

Several research questions were considered in this study. The main research question was: Who is responsible for implementing and supporting AAC in the classroom? An additional question addressed in the study was: Is there a difference in the views of SLPs and the views of teachers regarding who should be responsible for AAC support in the classroom?

It was hypothesized that each professional (SLP or teacher) perceives many aspects of AAC implementation and support to be the responsibility of the other

professional. More precisely, the null hypothesis (H_o) was: There is no difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom. The alternative hypothesis (H_1) was: There is a difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom.

In order to answer the two research questions, two additional questions needed to be considered:

1. What are the current responsibilities of teachers and SLPs for the support and implementation of AAC in the classroom?
2. What are the perceived responsibilities of teachers and SLPs for the support and implementation of AAC in the classroom?

Determining who was currently responsible and who should be responsible offered insight into the views of the teachers and SLPs responding to the survey.

More details regarding the design of the study can be found in chapter 3.

Theoretical Basis

Although the use of AAC teams has long been established (ASHA, 1996; Beck & Dennis, 1997; Kaiser, Hester, & McDuffie, 2001; Kent-Walsh & Light, 2003; Locke & Mirenda, 1992; Reichle, 1997; Robinson & Sadao, 2005; Sigafoos, 1995), these teams may need to function as a community within the school setting. Dewey (2000) looked at communities as a whole unit in which each member contributes. However, even communities must have a leader to provide guidance. This theory holds true for teams. Teams may be viewed as smaller versions of a community, working towards a common

goal. To help a student who relies on AAC, the team must work towards the development of effective, functional communication. In this setting, the team has multiple roles to fulfill, with various tasks that need to be met and must have a leader for each of the prescribed tasks. The team leader may change as the tasks change, just as community leaders change as targeted goals change (e.g., development of schools, enforcement of laws and creation of civil service positions; Dewey). In this way, the team forms a community of support around the student who uses the AAC system.

Results from research (Locke, 1990; Locke & Mirenda, 1992) indicate that SLPs and teachers do not have clear roles regarding device usage in the classroom. The Locke dissertation and published article include detail of the state of AAC services in 1990 and suggestions for further research. A review of the literature revealed that many of the issues researched by Locke continue to exist. These ongoing issues include lack of training in device programming, limited knowledge of techniques for incorporation into classroom, lack of understanding of device maintenance and lack of familiarity of types of devices available (Hamline, Nunes, & Worthy, 2007; Jung, 2007; McNaughton, Rackensperger, Benedek-Wood, Krezman, Willimas, & Light, 2008).

Professionals in any field need to be aware to their job responsibilities (Hunt, Soto, Maier, Muller, & Goetz 2002). When multiple responsibilities exist that may be addressed by more than one person, the person with the final responsibility for that task must be identified. In education, roles need to be delineated in order to ensure task completion. If teachers and therapists are not fully aware of all of their responsibilities, they are not likely to complete all required tasks. This in turn leads to a breakdown in the

supports provided to students. Lack of appropriate supports may lead to decreased student performance. The lack of defined roles and responsibilities of professional staff ultimately leads to limited progress or perhaps failure of students to meet their goals and outcomes. However, the failure may not have been as a result of student skill, but rather a result lack of appropriate supports. Dewey (2000, p. 49) observed that

> We are always dependent upon the experience of that has accumulated in the past and yet there are always new forces coming in, new needs arising, that demand, if the new forces are to operate and the new needs to be satisfied, a reconstruction of the patterns of old experience.

Although supported may be provided by a licensed teacher or SLP, their experience needs to include use and support of AAC.

Although collaboration has been reported to be the preferred method of AAC service provision (ASHA, 1996; Beck & Dennis, 1997; Kaiser, et al 2001; Kent-Walsh & Light, 2003; Reichle, 1997; Robinson & Sadao, 2005; Sigafoos, 1995) the roles of each team member have not been clearly defined. Collaboration may be provided in different formats, such as transdisciplinary teams or interdisciplinary teams (Locke, 1990; Locke & Mirenda, 1992). Several researchers have reported the benefits of collaboration (Beck & Dennis, 1997; Kaiser, et al., 2001; Kent-Walsh & Light, 2003; Sigafoos, 1995; Soto, Muller, Hunt, & Goetz, 2001a). It has also been noted that each team member brings his or her own strengths and philosophies to the team approach (Beukelman, Hanson, Hiatt, Fager, & Bilyeu, 2005; Hunt, Soto, Maier, Muller, & Goetz, 2002; Kaiser, et al., 2001). Yet the roles of the team members may not be clearly defined. This lack of clearly

defined roles may contribute to decreased AAC supports in the schools. It has been suggested that decreased AAC support services may lead to AAC abandonment (Hunt, et al., 2002; Hutchins, et al., 2005; Riemer-Reiss, 2000; Schepis, & Reid, 2003). When students abandon their AAC system, they may not be able to demonstrate learning. Their educational progress is likely to be stifled.

The underlying theory is that students who rely on AAC as a primary means of communication need appropriate supports in order to learn to use their AAC device. The basic tenet of this theory is that support needs to come from all individuals who interact with the student. While community support may be an essential factor in AAC usage and acceptance, support from school staff is often the starting point for AAC usage. The National Joint Committee for the Communication Needs of Persons with Severe Disabilities (1992) and ASHA (1996, 2004) issued guidelines for individuals who interact with students who use AAC, including the use of teams to provide teaching and support. However, team member roles are not clearly defined. Understanding why things failed may lead to real changes. Dewey (2000, p. 74) noted

> Knowledge of the past is significant only as it deepens and extends our understanding of the present. Yet there is a proviso. We must grasp the things that are most important in the present when we turn to the past and not allow ourselves to be misled by secondary phenomena no matter how intense and immediately urgent they are.

The need for clearly defined roles relates to the current study in that participant responses to questions provide insight into the views of teachers and SLPs who work with students who use AAC in the schools.

Operational Definitions

For the purposes of this study, the following operational definitions were used:

Augmentative/Alternative Communication (AAC): Relates to any communication approach designed to support, enhance or supplement the communication of individuals identified as non-verbal.

Augmentative/Alternative Communication Intervention:

> AAC intervention is the process of facilitating functional communication across all communicative contexts. Developing functional communication skills involves the use of multi-modal communication strategies. That is, an augmented communicator may learn to communicate using varied approaches including speech, communication boards, signs, gestures and high-tech devices. An important part of an AAC intervention program is to teach the augmented communicator the strategic competence to know when each communication modality or strategy is appropriate. (http://www.ussaac.org/INVENTION.html)

Assistive technology coordinator: "determines appropriate assistive and educational technologies for students with disabilities, provides technology support for schools and teachers and provides instruction on new technologies." (ASHA, 1996, p. 58)

Occupational therapist: A professional whose primary focus is the development of functional daily life skills, including activities of daily living.

Physical therapist: Addresses the gross motor and physical mobility of an individual, including seating and positioning, independent ambulation, assisted ambulation and access to the environment.

Speech-language pathologist: An individual professionally trained to prevent, screen, identify, assess, diagnose, refer and provide intervention for and counsel persons with or who are at risk for, articulation, fluency, voice, language, communication, swallowing and related disabilities. In addition to engaging in activities to reduce or prevent communication disabilities, speech-language pathologists also counsel and educate families or professionals about these disorders and their management (American Speech-Language-Hearing Association, 1996).

Student who is Nonverbal: Any student whose speech/spoken language is inadequate to meet his or her daily communication needs.

Teacher: An individual who is trained and certified or licensed in the area of instructing students aged three to 21 years old. Training may have been in specific subject matter (e.g., math, reading or science), grade level (e.g., kindergarten, second grade or high school) or in special education.

Assumptions

Several assumptions were made regarding the participants in the study: (a) Students have access to AAC in different classrooms; (b) teachers and SLPs are aware

that students should have access to AAC equipment; (c) AAC equipment is not being consistently used across classrooms, schools, counties and states; (d) teachers and SLPs are willing to complete a survey; (e) teachers and SLPs will answer honestly; (f) teachers and SLPs will understand the questions on the survey; and (g) teachers and SLPs know who is currently responsible for AAC services in their schools.

Limitations

Numerous limitations are noted regarding the study and the information collected for analysis. These limitations are: (a) This study will be limited by the number of professional who respond to the survey; (b) family members, caregivers and individuals who use AAC will not be asked to complete the survey, further limiting the information collected; (c) the survey will be provided in conjunction with the a technology advocacy and support center, limiting the potential participants to professionals who are listed on the a technology advocacy and support center e-mail list; (d) additional problems inherent with the survey process are those typically associated with Internet-based data collection, such as technical difficulties occurring with the site, difficulties with the links and spam filters blocking the link to the survey and are additional limiting factors.

Scope

The scope of this study encompassed perceptions of current and suggested roles of teachers and SLPs regarding AAC services provision in classrooms in the state of Mid Atlantic state. The study consisted of an Internet-based survey collecting responses to questions pertaining to current roles, suggested roles and availability of various school

staff. Participants were teachers and SLPs who were members of the technology advocacy and support center constant contact list and who currently provided or had provided AAC services to children in the classroom settings. There were approximately 2039 members of a technology advocacy and support center who participated in the constant contact list.

Delimitation

The population consisted of teachers and SLPs who were licensed or certified in their professional field, with access to an Internet-based survey, who were members of the technology advocacy and support center constant contact list and who were willing to respond to a short survey. Furthermore, these teachers and SLPs provide services in one Mid Atlantic state.

Significance of the Study

The information obtained from this study may lead to better understanding of the reasons impacting consistent and effective AAC usage in classrooms. This understanding may in turn lead to the development of teacher and SLP training courses focusing on improved AAC usage. In addition, results of this study may help fill in the existing gaps in the current literature. Ultimately, a student who needs AAC to effectively communicate, socialize and demonstrate learning may benefit from the increased knowledge and support of his or her educational staff. The student may be afforded the opportunities to use his or her system in classrooms settings. Families of these students may benefit from the expanded communication skills of the individual using AAC,

resulting in increased social interactions within the family and between family member. There is potential for increased opportunities offered to an individual who uses AAC, such as the ability to order his or her own meals, make choices in community settings and function without family members acting as interpreters. The prospect for enhanced socailization and community inclusion of the student AAC user may impact his or her potential employability. The impact for social change for students who use AAC begins with increased educational opportunities and participation to employment, self-actualization and participation in the global conversation. Students without voices will be heard.

Summary

Students have access to AAC devices in the school environment. School personnel, espcially teachers and SLPs, are expected to aid the student in using these devices when necessary. This aid may include device selection, programming, maintenance and functional use in numerous school situations. While the expectations regarding the skills of teachers and SLPs have increased, the roles of these professional regarding the implementation of AAC in the schools have not been clearly or adequately defined. Findings from a review of the literature pertaining to teacher and SLP preservice training, AAC in the schools and AAC abandonment supports the need for ongoing research in the area of AAC services in the school. Chapter 2 will contain a review of this literature.

Chapter 3 includes details regarding the methodology and process used to conduct the study. Results from the pilot survey, as well as information regarding survey reliability and validity are provided in this chapter. Chapter 4 contains specific information pertaining to survey results, meaning and significance of the results and tables showing summarized responses. Chapter 5 concludes this study with discuss of the findings, considerations for additional research and a summary of the social significance of the study results.

Chapter 2: Literature Review

Introduction

The field of AAC has been around since the early 1980s. The passage of several federal laws, including Public Law 94-192 (1975) Individuals with Disabilities Education Act (IDEA, 1990), No Child Left Behind Act (NCLB, 2002) and Technology Related Assistance for Individuals with Disabilities (TRAID, 1990) Program assured families that AAC would be considered for their child's use at home and in the classroom. However, it is not clear if the education of teachers and SLPs has remained current with the passage of these laws. This discrepancy has resulted in the possibility that teachers and SLPs are being required to implement technology for which they have not been trained. The roles of teachers and SLPs may change over time, but preservice instruction may not have changed to keep pace.

This section includes a review of the literature pertaining to teacher and SLP preservice training, current roles in the classroom, stated perceptions of teachers and SLPs, overview of AAC in the schools, skills necessary for successful AAC usage, best practices regarding AAC intervention, AAC abandonment and family views. Research covering 1990 through 2010 is considered.

As this field continues to grow, the lag between the conducting of research and its publication is often offset through the presentation of research findings at national conferences, pending publication. Some information obtained from conference proceedings, published on conference or association websites, including Closing the Gap,

Rehabilitation Engineering Society of North America (RESNA), International Society for Augmentative Alternative Communication (ISAAC) and American Speech-Language-Hearing Association (ASHA) National Conference is considered in this review.

Content and Organization of Research Review

This literature review contains summaries of AAC-focused research reported in peer-reviewed journals. In that the current study was based on research reported by Locke and Mirenda (1990), Locke and Mirenda's study is used as a starting point. A more in-depth view of this study, with particular attention to aspects currently being researched, is provided, followed by an overview of research reported from 1990 through 2005 will follow the summary of Locke and Mirenda (1990). The results of these studies is compared and contrasted throughout the research review section of this paper.

Strategy Used for Searching the Literature

Several Internet websites were used for this review: EBSCO (Elton B. Stephens Company) data bases, specifically Academic Search Primer, Education Resource Information Center (ERIC) and PsycARTICLES. The next site searched was the American Speech-Language Hearing Association website. This search produced articles regarding hearing impairments, adults, manufacturer relationships, medical practice, residential facilities, specific disabilities (dysarthria, aphasia, apraxia, etc). Of all the articles retrieved that were relevant to the topic, only two had not been previously retrieved from EBSCO. Additional searches were completed using GoogleScholar, United States Society for Augmentative Alternative Communication (USSAAC) and

Questia. Many of the articles returned from these searches focused specifically on autism and AAC; some were concerned with medical implications of AAC, others on adults AAC users. A few of the articles focused on specific treatment techniques or devices. Once articles were retrieved, the references sections were reviewed for additional articles that may not have been retrieved using the search parameters outlined.

The keywords searched included individual searches or pairings of the following words: *augmentative communication, AAC, communication devices, voice output communication aid (VOCA), voice output, dynamic display* and *speech generating device (SGD)*. These words and phrases were then paired with each of the following words and phrases: role(s), responsibility, training, special education teacher, teacher, speech-language pathologist, school, classroom, Individual Education Plan (IEP), usage, abandonment and support.

The searches resulted in a total of 510 articles. Of these articles, only 49 were relevant to the study. In general, there were 30 core articles, 13 of which were repeatedly referenced in the articles returned. These 30 core articles are included in this review. The remaining 19 articles provide information that expands across the multiple concepts considered in this study.

A great deal of research pertaining to AAC has been devoted specifically to individuals with autism, efficacy outcomes and family/care giver attitudes (364 articles returned using the search parameters). However, research related to the training of AAC support professionals or their views regarding AAC in the school setting has been limited. Campbell, Milbourne, Dugan and Wilcox (2006) reviewed 104 articles

pertaining to infants and toddlers and assistive technology published between 1980 and 2004. Of the 104 articles, only one focused on AAC.

Additionally, Snell, Linh-Yuan and Hoover (2006) searched for AAC articles published between 1997 and 2003 that met specific criteria. A total of 40 articles were found. Criteria included single subject design, intervention research for individuals with severe disabilities, birth to 2 years old. The authors noted limitations in the AAC databases.

In an invitation for applicants research related to users of AAC systems, the National Institute on Deafness and Other Communication Disorders notes:

> The overall effectiveness of AAC interventions has been documented in a number of anecdotal reports, single case studies and few group studies…Several investigations have reported positive language outcomes, including increases in vocabulary size and use and production of multi-symbol utterances. However, the long-term process of communication, language and literacy development through augmented means, as well as the broader educational and social implications of this process, has not been analyzed in detail. (National Institute of Health, Program Announcement, 2000, p. 2)

There is limited published research into the issues surrounding AAC usage and the social implications of AAC usage.

Locke and Mirenda Study

Locke and Mirenda (1992) set out to clarify the roles and responsibilities of special education teachers regarding the implementation of AAC in the classroom. Using survey responses from 210 teachers, Locke and Mirenda found similarities across the roles teachers prefer to assume, those they believe they are qualified to assume and those that are appropriate to assume. More specifically, Locke and Mirenda (p. 205) reported that 70% or more of the teachers reported responsibilities for the following roles: adapting curriculum, preparing and maintaining documentation, writing goals and objectives for AAC users, assessing cognitive abilities, acting as liaison between team and parents, assessing social capabilities, providing for ongoing skill development, identifying vocabulary, determining student motivation regarding AAC usage and determining communication needs of students.

In addition, Locke and Mirenda (1992, p. 204) reported that interdisciplinary team models were most commonly used in the field of AAC (39% of teachers reporting). It appeared that teams, regardless of type of team, worked with students on an as needed basis. Team members and roles were varied across settings and states. Locke and Mirenda (p. 206) also noted that the number of years teaching, amount of AAC education, years teaching special education and years working with students who are nonverbal were not found to be significantly correlated to the number of roles and responsibilities assumed by the teachers.

Locke and Mirenda (1992, p. 208) reported four items teachers indicated were important to improving their ability to implement AAC in the classroom. These skills

included, "(a) increased AAC knowledge (83%); (b) greater clarification of their MC team role (81%); (c) additional time to work as a team (62%); and (d) additional time to work on specific AAC tasks (62%)." Ultimately, the teachers reported a need for clarification of roles across team members and improved team interactions as necessary for increased AAC implementation and support in the classroom.

Locke and Mirenda (1992) noted several areas for further research. Among these areas are the needs for determining current AAC courses for professionals, most effective team model format for AAC services, understanding of how team members are assigned as well as team leadership, roles and responsibilities of other team members, how roles and responsibilities are assigned, how is AAC training best offered to adults and the current and future AAC needs of public schools (Locke, & Mirenda, p. 209). Overall, Locke and Mirenda emphasized the need for teaming when providing AAC support; more importantly, the study results identified the roles teachers believed they were most qualified to assume.

Overview of Research Related to AAC in the Schools

Status of the Research

Research into the use of AAC in schools has taken various forms and focus over the past three decades. However, only a limited number of studies pertaining to AAC in the schools were reported in peer reviewed journals between 1990 and 2005. During that time, the need for all individuals to have a means of functional expressive communication was documented by the National Joint Committee for the Communication Needs of

Persons with Severe Disabilities (1992). In 1992, the National Joint Committee for the Communication Needs of Persons with Severe Disabilities estimated that approximately 2 million Americans were unable to use spoken language as a functional means of communication. It was further indicated that the needs of these people were not being adequately met by schools, clinics or other facilities. This lack of support was exacerbated by a lack of preservice training offered to professionals.

Lack of published or easily obtainable research has been an underlying issue for those attempting to provide AAC support in the classroom (Campbell, et al., 2006; Snell, et al., 2006). Often, the research was specific to one communication device or disabling condition. For example, Snell, et al (2006) searched for AAC articles published between 1997 and 2003 that met specific criteria. Criteria included single subject design, intervention research for individuals with severe disabilities, birth to 2 years old. A total of 40 articles were found. The authors noted limitations in the AAC databases. Campbell, et al., (2006) conducted a review of 104 articles pertaining to infants and toddlers and assistive technology, published between 1980 and 2004. Of the 104 articles, only one focused on AAC.

Additional research published between 2006 and 2009 returned by the search included seven peer reviewed articles related to AAC services in the schools. The focus of these articles was service provision and views of families or individuals who use AAC. Although it is possible that additional research had been conducted, articles were not readily available. In addition, some research results were presented at conferences and not necessarily peer reviewed. It should be noted that research specific to one type of

communication impairment or contributing diagnosis (e.g., autism spectrum disorders) was not included as part of this search.

The limited number of studies returned in the current and previous searches highlights the paucity of readily available information regarding AAC services. The limited published information may contribute to the difficulties reported by professionals pertaining to increasing knowledge of AAC.

Importance of AAC

In order to ensure that a student uses his or her AAC system, all individuals who interact with that student must learn to use the system (Johnston, McDonnell, Nelson, & Magnavito, 2003). It was further observed that all of the adults who interact with a child who uses AAC need to encourage the use of the system across all settings. Use of AAC was noted to decrease some maladaptive behaviors, increasing student inclusion and acceptance. This observation was supported by the findings reported by Johnston, Reichle and Evans (2004). Johnston, et al expanded by noting that AAC systems may aid in the decrease of maladaptive behaviors by providing students with an acceptable means of communication.

Skau and Cascella (2006) reported that SLPs, teachers and parents must work together to integrate AAC into the child's home and school settings in order for the student to fully reap the benefits of AAC. It was noted that there are various forms of AAC, including sign language, picture communication boards and voice output systems, allowing for use of multiple means of communication as the situation or environment

required. It was also noted that a number of AAC systems are relatively easy to use. Teachers and parents should consider incorporating these systems into the child's routines to supplement communication and support the direct sessions provided by the SLP. The provision of support and usage of an AAC system across environments enhanced the student's ability to use the system.

Needs of Individuals Who Use AAC

It has been noted (Kaiser, et al 2001) that in spite of level of disability, almost all children can learn communication if they are provided with appropriate support. This support must be provided by family, teachers, therapists and the community. Therefore, various people require training in AAC usage.

In order to adequately support a student who uses AAC, a basic understanding of the needs of those students may be beneficial (Reed, Fried, & Rhoades, 1995). However, the opinions of individuals who use AAC have often been overlooked. Reed, et al., noted that individuals who use AAC should have greater input into all aspects of decision making regarding the selection, implementation and use of AAC systems.

Rackensperger, Krezman, McNaughton, Willimas and D'Silva (2005) surveyed adults who use AAC. Many of these adults reported that their AAC support in school and from other professionals was unsatisfactory. However, these individuals varied in their preferred learning styles and level of satisfaction with different support personal. Many of these adults reported that their families provided a great deal of AAC teaching

and support. In general, they indicated that the views and preferences of the person who will be using the AAC system should be held tantamount to the overall process.

In order to meet the needs of individuals who use AAC, the needs and learning styles of these people must be taken into consideration. While there may be some commonalities, each person who uses AAC has his or her own unique concerns. Nonetheless, Sevcik, Romski and Adamson (1999) found that incorporation of five essential components led to the development of AAC as a functional means of communication. These components were used in both the school and home. However, techniques demonstrated to be effective with one AAC user were not necessarily effective with a different AAC user, especially when the underlying diagnosis was different (e.g., student with cerebral palsy compared to student with autism). Furthermore, Beukelman, Burke, Ball and Horn (2002a) reported that in order to meet the needs of individuals who use AAC professionals must be familiar with the various types of AAC available and be able to teach these skills to others.

Strategies for Implementing AAC

A variety of techniques have been utilized in treatment and classrooms to aid students in learning to use their AAC systems. Sigafoos (1995) indicated that while there are multiple strategies for supporting AAC use, not all have been empirically validated. Ultimately, use of the AAC system across all settings and with multiple people was essential to successful use of an AAC system for functional communication. Therefore, all individuals who interact with the individual who used AAC must be familiar with the

techniques demonstrated to be the most effective for that person. In general, child-directed strategies have been observed to yield the greatest gains in functional communication (Snell, Lih-Yuan, & Hoover, 2006).

Teachers and therapists need to work collaboratively in order to develop and implement effective strategies for each student. However, Ehren (2000) found that pull-out speech therapy sessions continued to be preferred by parents, even though studies have shown that many children benefit from push-in sessions. Conversely, SLPs are concerned that they are often seen as extra help, instead of being seen as providing specific a service. Ultimately, teachers and SLPs must share responsibility for student success or failure.

Ultimately, children with severe communication impairments required access to AAC as early as possible (Reichle, 1997). Transdisciplinary approach was necessary to meet the complex needs of these children. Reichle also noted that intervention should take place in naturally occurring opportunities in order to provide realistic contexts for communication and decrease the need for artificial interventions.

Research into AAC using primarily focused on usage. One issue not addressed in the research was the rate and reason for technology and AAC abandonment (Riemer-Reiss, 2000). Some individuals stop using their AAC systems; however, it does not appear that these individuals have been asked why they chose to abandon their AAC systems.

Teams

Common practice for AAC support services involves the use of teams (Giangreco, 2000; Soto, et al., 2001a; Robinson, & Sadao, 2005). A great deal of collaboration is required for effective inclusion of students who use AAC to take place (Robinson, & Sadao, 2005). Hunt, et al., (2002) supported the need for collaboration and identified possible team members. Additionally, the researchers noted the need for clearly stated roles of each team member. Conversely, Giangreco (200) reported that although research has indicated that teams are preferred for AAC service provision, often the size of the team can be overwhelming and counterproductive. Use of a team can result in gaps, contradictions and overlap of services.

Further issues surrounding use of teams included knowledge differences across team members and how these differences impacted students. Although SLPs may be responsible for speech services in the school, the use of AAC requires certain expertise (Depaepe, & Wood, 2001). Often these services are provided by an AAC specialist. Yet, these specialists are not always familiar with the student's educational goals and curriculum, nor are they familiar with the interests and skills of the student. However, Soto, et al (2001a) noted that while collaboration is necessary for successful AAC usage, teachers and paraprofessionals typically have the most daily interaction with students. Skills need for and the barriers to AAC usage were reported. There was a discrepancy between the perceptions of who should be primary support to the student who uses AAC.

A final concern was that all AAC team members must acquire at least some level of knowledge of AAC usage and implementation (Beukelman, et al., 2005). However, it

was likely that skill levels of team members will vary. This was compounded by the rapid changes in technology, making it difficult for special education teachers to remain current with available technologies (Lahm, 2003). Assistive technology specialists may be necessary to fill the resulting gap in previous AAC knowledge and knowledge of current systems and instructional techniques.

Needs of Teams

Although not specific just to AAC support, teachers who hope to fully include students who use AAC into general education classrooms need to develop additional skill sets (Kent-Walsh, & Light, 2003). In order for these skills to be developed and refined, general education teachers need team communication and collaboration, classroom support provided by appropriately trained assistants, and additional training and preparation time. In addition, the assistive technology coordinator (ATC) would also need additional trainings. The CEC (2004) updated standards for assistive technology specialists. These included: Foundations, Development and Characteristics of Learners, Individual Learning Differences, Instructional Strategies, Learning Environments and Social Interactions, Language, Instructional Planning, Assessment, Professional and Ethical Practice and Collaboration. Ultimately, all team members need increased collaboration skills in order to meet the support needs of students who use AAC.

Summary

Overall, the findings reported in these articles supported research indicating the need for teams when implementing AAC services. However, those responsible for the

services are often lacking in appropriate training. Although progress has been made in the development of preservice training for teachers and SLPs, there continues to be a paucity of adequately trained personnel in the schools to support the increasing number of students who use AAC.

Literature Review: Findings, Comparisons and Contrasts

Teacher Training and Roles

What are teachers taught? Information contained on the Bureau of Labor Statistics website (http://www.bls.gov/oco/ocos070.htm#nature) indicates that all states require general and special education teachers to be licensed. However, there are several pathways to licensure, including completion of a traditional land-based university program, distance learning and accelerated programs. While these programs all have as their objective educating future teachers, there are no national standards as to what the preservice training must include. Most of these programs include coursework on curriculum, instruction/modified instruction, diagnosis, legislation, disabilities and a student teaching component. The exact content of these categories of courses vary across institutions.

The Council for Exceptional Children (CEC) considered to be the primary special education agency, has outlined curriculum standards for the education of preservice special education teachers. This core curriculum consists of ten standards: foundations; development and characteristics of learners; individual learning differences; instructional strategies; learning environment and social interactions; communication; instructional

planning; assessment; professional and ethical practice; and collaboration (http://www.cec.sped.org/Content/NavigationMenu/ProfessionalDevelopment/ProfessionalStandards/Initial_Content_Standards.doc). Although not bound by the opinions of CEC, (2004, p.8) "Currently, over forty states are committed to align their licensing processes with the CEC standards."

Special education teachers are generally required to learn the same course content as general education teachers. However, Brownell, Ross, Colon, and McCallum, (2005) noted that special education teachers will typically attend courses designed to teach curriculum adaptation, teaching life skills and collaboration with other professional staff.

Cannon, Idol and West (1992) survey results identified 96 key instructional tasks preservice general and special education teachers should learn. These fell under the areas of assessment/diagnosis, instructional content, instructional practices, managing student behavior, planning and managing teaching/learning environment and monitoring/evaluation procedures. Although mention is made of adapting the curricula and materials, there is no discussion regarding AAC in the classroom. This study was conducted approximately 10 years following the introduction of AAC as appropriate for students with communication impairments (p. 305-311).

Koul and Lloyd, (1994) surveyed and then compared the number of colleges and universities offering degrees in speech-language pathology and special education that offered or required course or course content in AAC. Of the 120 responding programs offering degrees in special education, 24% (29 of 120) offered specific course work in AAC. Of these, 65% (19 of 29) were introductory or overviews of AAC. Across the

preservice level, a total of 36 AAC courses were offered to special education teachers. A total of 14 of 36 (39%) were required for special education degree completion. These results were echoed in the findings reported by White, Wepner and Wetzel (2003), in that many of the universities surveyed did not offer courses in assistive technology to preservice teachers. In addition, Parette and Angelo (1996, p.91) found that "67% of professionals reported insufficient training in college regarding technology and its applications for children with disabilities."

Some universities have begun to address the issue of limited preservice education in assistive technology. The University of Mid Atlantic state Special Education Department revised its five-year undergraduate teacher preparation program. Prior to the revisions, course work and practical experiences lead to certification in one of four areas:" early childhood (EC), educational handicaps (EH), secondary/transition (ST) or severe disabilities (SD). The EC area prepared teachers to work with preschool-aged children with disabilities from birth through kindergarten. The EH and ST specialty areas focused on high-incidence disability levels; the EH area prepared teachers to work with students in Grades 1 through 12 and the ST area focused on skills needed to transition from the world of school to the world of work. The SD area prepared teachers to work with individuals with low-incidence disabilities in Grades 1 through 12" (Lovingfoss, Molloy, Harris & Graham, 2001, p. 105). This program was revised to meet standards established by CEC, including those standards addressing Core Knowledge, General Education and Individualized Education. The revised program includes coursework in

collaboration with team members and increased knowledge in general education curriculum and special education services. It was reported that

> students in the revised program will be prepared to teach students across all disability levels and settings within one of three age-based specializations: Early Childhood Special Education, Elementary Special Education and Middle/Secondary Special Education. Curriculum foci will include both academic and functional life skills, including assistive technology and alternate communication systems. (Lovingfoss, et al., 2001, p. 105)

These revisions may increase the preparedness level of new teachers regarding supporting students who use AAC.

Ford, Pugach and Otis-Wilborn (2001) reported similar changes at the University of Wisconsin-Milwaukee. In order to better meet the needs of graduating students in teacher preparation programs, the university revised the teacher training program. The newly revised program included a focus on collaboration between special and general education teachers. Although the teacher may not have direct experience in working with students with all types and levels of impairments, the teacher will have at least taken coursework to increase his or her understanding of the needs of these students and their families. Knowledge of accommodations and their impact on all students in the classroom evolve as part of the collaborative preservice process. While specific focus is not offered on the use of AAC, empathy towards the student who utilizes AAC is encouraged.

Overall, Jung (2007) noted that additional training is needed for both general and special education preservice teachers in order for them to develop positive attitudes towards inclusion and acceptance of students with special needs in general education classrooms. However, course work alone is not sufficient; guided hands-on experience, using the tools available to students in special education is needed.

Current roles and responsibilities of teachers. Teachers are responsible for the education of each student in their classroom. The unique needs and learning styles of each student must be addressed by the teachers and support staff. This task may involve the use of methods not normally utilized in general education settings. Student education extends beyond the traditional concepts of reading, science, math and social sciences.

Often, the needs of students who use AAC are best met through collaborative teaming. Teachers and paraprofessionals may have the most daily contact with the student, necessitating the need for ongoing support and training from related service providers, (Soto, et al., 2001a, p.62). This observation was also noted by Sigafoos (1995, p. 185) in that some techniques for encouraging AAC usage require ongoing interaction with the child. Ecological assessments provide information about a typical day for a child. However, if this instructional strategy is to be utilized, those professionals who are in the student's immediate environment on a daily basis need to be trained in AAC usage. Ultimately,

> When a student's Individualized Education Program requires assistive technology equipment and software, a teacher must know its application and use. In addition, the training of a student's parents or guardians in the use of assistive technology is

> critical. Time is an important issue; any delay between acquisition of technology and its actual use by the student reduces their learning time and enthusiasm. (White, et al., 2003)

More specifically, teachers must be able to meet not only the AAC needs of the student, but they must do so in a timely manner.

Professionals in general education settings identified skills necessary to work with students who use AAC in an inclusive setting. "(a) collaborative teaming, (b) providing access to the curriculum, (c) cultivating social supports, (d) AAC system maintenance and operation and (e) creating classroom structures that support the learning of heterogeneous groups of students" (Soto, et al., 2001b, p. 53). These skills are in addition to the skills normally associated with a general or special education teacher.

Roles teachers identify as within their scope of practice. Upon entry to preschool, children receive communication support, modeling and training from teachers. Teachers have significant influence on the quality and quantity of their students' overall, as well as, communication development, (Kaiser, et al., 2001). Although teachers may expect to have some impact on the language develop of the students in their classrooms, they may be more accustom to aiding in vocabulary development and improvement in grammatical structures of both written and spoken language. Use of AAC may be outside of the teachers' perceived role. Responses to the Wolff Heller, Fredrick, Dykes, Best, and Cohen surveys (1999, p.219) indicated that 45.7% of teachers did not feel they were well trained in developing AT plans, 52.5% were not well trained in teaching

augmentative communication devices and systems and 50.8% were not well trained in teaching students the use of assistive technology device.

Lahm (2003) indicated that advances in assistive technology may make it difficult if unattainable for special education teachers to develop sufficient expertise in the variety of AT devices available. This lack of knowledge in turn creates a situation in which teachers are unable to meet the mandates of all of the children in their classroom. Therefore, assistive technology specialists may be required to fill the resulting gap in the education of students with special needs. All special education teachers should have at least a basic knowledge of AT; however, programs for preservice teachers are lagging behind the development of AT and the entry of new professionals into the classroom.

Lahm (2003) further noted that access to the best tools is inadequate without the knowledge and ability to use them. This lack of skill impacts both the teacher who needs to instruct the student on how to implement the tool, as well the student who needs to use the tool. In a survey of teachers working in Oregon, it was reported that there were five specific problems related to AAC and AT usage:

1. lack of skills among many educators to access the AT needs of their children and youth with disabilities
2. lack of skills among educators to employ AT for children and youth with disabilities,
3. lack of understanding regarding the best ways to address AT in IEPs,
4. lack of resources available to help educators learn to use technology as an instructional tool and

5. lack of information available to educators on the best ways to teach technology skills to students. (Lahm, 2003)

The five areas addressed impact the teacher's ability to provide effective instruction, and the student AAC user's ability to demonstrate their learning.

In a related study, Lovingfoss, et al., (2001) found that teachers did not feel capable of performing tasks associated with child specific assistive technology, such as AAC. It was noted that programs addressed collaboration among professionals, but did not address collaboration with paraprofessionals and other types of support staff. This deficiency resulted in lack of interdisciplinary collaboration between teachers and other school professionals. The author recommended not only preservice training in assistive technology, but also on collaborating with and supervising paraprofessionals.

Speech-Language Pathologist Training and Roles

What are SLPs taught? The American Speech-Language Hearing Association (ASHA) has developed professional standards for the certification of speech-language pathologists. However, licensing requirements vary across the individual states. Preservice course work for speech-language pathologists as established by ASHA includes courses in articulation, fluency, voice, language development, anatomy and physiology oral motor functions and swallowing, diagnostics/assessments, hearing acquisition, disorders of communication, family training/counseling and prevention of communication impairments (www.ASHA.org). Future SLPs also receive coursework in various disorders and those disorders impact on student's communication.

Not all states require licensing for SLPs, further confounding the issue of SLP training. SLPs who plan to work in one of the four states that do not require universal licensure (license required to work in any setting as an SLP, most with continuing education requirements) may not receive the same training as SLPs who plan to work in a state with mandated universal licensure provisions. In addition, some training programs have been accredited by ASHA, thereby following the ASHA standards. The accreditation of these programs is reviewed periodically. Programs not accredited may not follow the ASHA standards. The result is that SLPs are not trained consistently, nor are they required to adhere to the same continuing education requirements.

Not all colleges and universities offer coursework in the area of AAC to future SLPs. Koul and Lloyd (1994) found that of 131 speech programs, 81 (62%) offered specific coursework in AAC. Of these courses, 61 of 81 (67%) were introductory or overviews of AAC. Speech-language pathology degree programs contained a total of 122 AAC courses; of these, 40 (33%) were required for degree completion. Both types of programs offered some AAC content in non-AAC courses. In addition, these courses and the continuing education courses offered may not reflect current best practices or advances in AAC systems. Eight years later, Beukelman, et al., (2002b, p. 250) noted that 82% of SLP training programs in the United States of America have at least one course on AAC and that 20% of SLP grads from University of Nebraska chose to become AAC specialists.

Ratcliff, Koul and Lloyd, (2008) considered the current level of AAC preservice training offered to SLPs. Surveys were sent to 290 universities; 168 responded. Overall,

73% (122) offered a course specific to AAC; of these 92 were offered to graduate students only, 24 to both graduate and undergraduate students and three to both graduate and undergraduate level students. Only 63 (52%) indicated that the course was required for SLPs; 11 were required for SPED students. It was determined that 25% of the respondents did not offer any courses or course content on AAC. Only 56% of the SLPs students received clinical clock hours (practicum hours) in AAC. It should be noted that at this time, there are 236 colleges and universities in the United States that offer Master degrees in speech-language pathology that have ASHA accreditation (http://hes.asha.org:8080/EdFind/Masters/MastersSearchResults.aspx).

What are the current roles and responsibilities of SLPs? Although multiple areas of coursework are studied, an SLP typically does not practice in all areas of the field. SLPs in various settings, such as hospitals, nursing homes and schools, are likely to practice different aspects of the field pertinent to the setting.

> The overall objective of speech-language pathology services is to optimize individuals' ability to communicate and/or swallow in natural environments and thus improve their quality of life. This objective is best achieved through the provision of integrated services in meaningful life contexts. ("Scope of Practice in Speech-Language Pathology," 2002)

Although autonomous in nature, the SLP may work best in collaboration with other professionals.

SLPs are typically responsible for addressing communication issues in schools. As defined by the National Joint Committee for Communication Needs of Persons with Severe Disabilities:

> Communication is any act by which one person gives to or receives from another person information about that person's needs, desires, perceptions, knowledge or effective states. Communication may be intentional or unintentional, may involve conventional or unconventional signals, may take linguistic or nonlinguistic forms and may occur through spoken or other modes. (1992, p. 3)

However, implementation of AAC services requires additional input and expertise.

Roles and responsibilities of SLPs are muddied by the perceptions of the public regarding SLP services. Difficulties arise when SLPs are required to work under an academic model (provide access to the curriculum) but others want a medical model approach (obtain or regain normal function). This conflict may put the SLP in an adversarial role secondary to differing expectations. For example, Starble, et al., (2005, p. 48) indicated that parents reported that they needed in home AAC services in order to learn how to effectively use the system to interact with their child. They also noted that the SLP should be responsible for these services. However, most school-based SLPs provide services in the school. While training for caregivers may be available within the school setting or as part of a student's indirect services, the SLP is not likely able to go to the student's home. Ultimately, parents indicated that SLPs in general should perform four functions: trainer/educator, expert, negotiator and collaborator. Hutchins, et al.,

(2005, p.48) reported that parents cited a preference for interacting with the SLPs as trainer/educators.

Traditionally, SLPs provided services directly to a student in a "pull out" model. Yet, communication instruction should not rely solely on direct intervention, but rather on naturally occurring opportunities for communicative interactions. These opportunities may be subtle, but the resulting communication may have more meaning for the student, especially when compared to instruction given without context. Many children with severe disabilities benefit greatly from indirect instruction; some may require direct intervention, (Reichle, 1997, p. 121-124). Reliance on direct instruction, as is often the case with individual therapy sessions, may result in an over reliance on prompts, dependency on specific situations to use a communicative act or "a range of conditions that is so narrow that it limits the usefulness of the skills being taught" (Reichle, 1997, p. 125). These concerns were also noted by Soto, et al., (2001, p.70). SLPs indicated that their services would be more effective if provided in the classroom, but teachers, administrators and parents often expected them to remove the child from the classroom in order to provide services. Provision of services in the classroom would afford the SLP the opportunity to train everyone in the classroom, including peers and staff, to more effectively communicate with the student receiving services.

The published scope of practice in speech-language pathology includes statements regarding the SLP and AAC services. Contents of this document indicate that SLPs in any setting should establish appropriate communication modalities for the individuals they serve, including techniques and strategies for assessment and use of AAC (2002).

SLPs are also responsible for educating the public, family members, care givers, educational staff and other professionals on the causes, prevention and treatment of communication impairments. Appropriate referral to other professionals as needed is an additional responsibility of all SLPs.

Roles speech-language pathologists identify as within their scope of practice. Training and education of SLPs may influence their perception of which roles are their responsibility in the classroom. However, this training may vary. Therefore, SLPs may turn to the position statement established by ASHA as the primary source for determining their roles and responsibilities. ASHA (1996, p. 38) indicated the roles of the SLPs in the schools to include: review of all assessments; comparing assessment results to typical communication development scales; determining impact of various factors that may have impaired communication development and establishing remediation plan to off-set these factors, implementing chronological and developmental age appropriate materials; use of accepted therapy techniques; collaboration with parents and school staff; and observation and interaction with students to monitor progress. It is also noted within the statement that:

> In order for a communication disorder to be considered a disability within a school-based setting, it must exert an adverse effect on educational performance. The speech-language pathologist and team determine what effect the disorder has on the student's ability to participate in the educational process. The educational process includes preacademic/academic, social-emotional and vocational performance. (ASHA, 1996, p. 22)

Parette and Angelo (1996) observed that SLPs assume primary role for assessment of students' communication strengths, weaknesses and needs. Ultimately, Ehren (200, p. 223) indicated that SLPs need to address the needs of students by providing direct or indirect services to students on their caseload, and providing support to teachers and classroom staff to aide them in communicating with the students.

In addition, school-based SLPs need to determine the need for alternative communication for the students on their caseload (ASHA, 1996). However, some individuals who use AAC noted that the level of assistance received from SLPs varied from helpful to not at all helpful, (Rackensperger, Krezman, McNaughton, Willimas, & D'Silva, 2005). Romski and Sevcik (2005) reported that often SLPs believed that other staff would provide AAC support to the students on their caseload. This confusion may in part be secondary to a position statement published by ASHA (1996) which notes that SLPs are responsible for providing information regarding the physical environment of classrooms as it impacts communication, monitoring technology needs based on curriculum standards and recommending AAC devices necessary to participate in the classroom. SLPs may be receiving conflicting messages when taking into consideration the expectations of the various entities involved in education and the position statements of their professional organization.

Underlying Issues

The National Joint Committee for the Communication Needs of Persons with Severe Disabilities, (1992, p. 2) reported that "approximately 2 million Americans who

are unable to speak or who demonstrate severe communication impairments, but there is a shortage of trained personnel to serve them. Few personnel preparation programs address the communication needs of persons with severe disabilities."

Item eight from the Communication Bill of Rights (National Joint Committee for the Communication Needs of Persons With Severe Disabilities, 1992, p. 4) states that persons who use AAC have a right to access the devices consistently throughout the day and that the devices are in good working order. In order to comply with this guideline, those individuals who work with a person use uses AAC, be it in a classroom, therapy room, home, school or any other environment, must have sufficient knowledge to ensure that the device is available and working properly. However, the committee found that the preservice and ongoing inservice training for professionals regarding the use of AAC was inadequate at the time of their meetings. The Committee reiterated the importance of professionals and families working together as equals from assessment throughout intervention. Furthermore, the responsiveness of the environment is a key factor in communication development, especially for children who use AAC. It is necessary to teach communicative functions, as well as forms and these are best conducted in real world or natural environments, not in isolation. Therefore, pull-out therapy sessions, as traditionally provided by SLPs and often requested by parents, may not be particularly effective in teaching many aspects of AAC usage.

Conversely, use of "push-in" sessions, those sessions which the clinician provides within the classroom instead of removing the student from the classroom, may offer one solution to the issue of limited time for collaboration between teacher and SLP.

However, not all professionals view these collaborative, in-class sessions the same. In some instances, the SLP may be seen as simply another pair of hands; in other cases the teacher and SLP work together to ensure all students participate in the lesson, including those students who use AAC. Without clearly defined roles and understanding of collaborative teaching or "push-in" sessions, additional time may be required, those lessening the positive outcomes of these types of sessions. In addition, not all SLPs believe in the appropriateness of push-in sessions. Ehren (200) reported that ultimately, the decision to provide services in or outside the classroom need to be based upon the needs of the student.

Overall, in-classroom services often best meet the needs of students, especially when compared to the traditional model of pull-out, individual services. Considerable cooperation and coordination between the SLP and teacher are required in order for in-classroom sessions to be effective (Beck & Dennis, 1997). As Giangreco (2000) noted, the ability to work effectively as a team member can be addressed in preservice training; however, it must be practiced and nurtured in order for the team to continue to thrive.

Overview of AAC in the Schools

Teams, Specialists and Individuals

Professionals who provide AAC support services must be familiar with the types of AAC available, be able to apply and use computer based technology and teach these skills to others, (Beukelman, et al., 2002a, p. 242). Research has supported the use of collaboration or other teaming methods as preferred means of AAC service delivery

(ASHA, 2005; Beukelman, et al., 2002a; Depaepe, & Wood, 2001; Ehren, 2000; Hunt, et al 2002; Johnston, et al., 2003; Kent-Walsh, & Light, 2003; Locke, & Mirenda, 1992; National Joint Committee for the Communication Needs of Persons with Severe Disabilities, 1992; Reichle, 1997; Robinson, & Sadao, 2005; Sigafoos, 1995; Skau, & Cascella, 2006; Soto, et al., 2001; Starble, et al., 2005). Collaborative teaming, including school staff and parents/caregivers, was determined to be an effective mechanism for supporting student AAC use in the classroom. Teachers noted a feeling of support from related service staff; related service staff reported a feeling of achievement related not only to student progress, but in the overall efficiency and effectiveness of the collaborative teaming process. Each team member was aware of the students' IEP goals and had an understanding f his or her specific roles as related to each student, (Hunt, et al., 2002, p. 29). However, the skill level of each member may vary (Beukelman, et al., 2005). Nevertheless, Hunt, et al., (2002, p. 34) went on to note that specific preservice training for all team members is essential for effective teaming, as well as exposure to various teaming strategies and techniques. Sigafoos, (1995, p. 187) found that the use of one specific teaching strategy or communication modality does not mean that only the teacher or the SLP should be primarily responsible for the intervention, but rather, all those who interact with the student must be proficient in the chosen technique.

However, some individuals found use of teams to be counterproductive (Giangreco, 2000). Often the size of the team can be overwhelming for many professionals on the team as well as the caregivers. Although the input of each team member has value, a large team may in fact decrease the overall effectiveness of the

team. Ineffective teaming can lead to gaps, overlaps and contradictions regarding services. Therefore, it may be appropriate to determine which team members are actually necessary in order for the student to make progress, (Giangreco). For example, Soto et al., (2001, p.70) noted that general education teachers and parents indicated paraprofessional should be the key support person; SLPs stated the general education teacher should be key support person.

Still other individuals and their family members indicated that AAC services could be best provided by an individual trained specifically in AAC, with few, if any, other roles (Lahm, 2003; Rackensperger, et al., 2005; Reichle, 1997). AAC specialists often have backgrounds in occupational therapy, engineering, special education or speech-language pathology, (Beukelman, et al., 2002a, p. 242). ASHA (1996, p. 58) defined an assistive technology specialist or coordinator as an individual who "provides assessments for students, support to parents and classroom teachers and technical assistance to staff responsible for students identified as requiring alternative communication systems; recommends assistive devices that will enable students to communicate and participate in regular classrooms."

Yet, most AAC specialists are not fully able to assess all aspects of the student's development, growth and status necessary for complete, detailed AAC assessment. The AAC specialist must obtain information from other team members regarding the student's physical, sensory, cognitive and other skills. Depaepe and Wood (2001) reported competencies for professionals who will work with students who use AAC need

to be developed and implemented. These competencies should be developed at the preservice level; however, ongoing trainings should be made available.

Interviews with individuals who use AAC systems revealed that these individuals reported negative feelings towards professionals and that they believed their families provided the greatest opportunities for social interaction using the AAC system (Hutchins, et al., 2005). Furthermore, families indicated that teachers could help families by working with community agencies, obtaining AAC evaluations, funding for the system and organizing training for those individuals who will supporting the student AAC user (Hanline, Nunes, & Worthy, 2007, p. 81). Although use of AAC is mandated in the Individuals with Disabilities Education Act 1990, Part C (Romski, & Sevcik, 2005, p. 180) obtaining funding and arranging for off-site evaluations may be beyond the abilities and scope of practice of most special education teachers. White, et al., (2003) indicated that successful AAC implementation is dependent upon the creativity, skills and knowledge of teachers who employ previous learning and information gained from ongoing trainings.

Individuals who use AAC indicated that specific skill sets are necessary in order to support the needs of students who use AAC in the classroom. These skills include the ability to participate in collaborative teaming, assisting in accessing the curriculum, facilitating socialization, maintaining and operating the AAC system and use of Universal design for learning techniques (Soto, et al., 2001, p.67). These are skills that should be developed by all educational staff, not just one discipline. Schepis and Reid (2003, p. 60) found that although the use of AAC has become more common place, “there has been

little research into the role of human resources staff (e.g., teachers and assistants, residential workers, etc.) with respect to the successful use of these devices among people with severe disabilities and complex communication needs." Adequate training of educational and support staff is essential for successful AAC usage in any setting.

Actual AAC Usage in the Schools

There are numerous strategies for encouraging and enhancing the use of AAC in the classroom. Although some techniques have been empirically validated, others not yet validated may also have positive impact on the acquisition of AAC skills and usage (Sigafoos, 1995). Children naturally use multi-modal means of communication during typical development. However, children with severe disabilities may not acquire communication skills that are on par with their typically developing peers. The typical sequence from sounds, sounds paired with gestures, sounds/gestures paired with words and finally spoken words paired with graphic symbols may not be used by children with severe communication impairments. These children will need to have access, as early as possible, to augmentative communication systems (Reichle, 1997, p. 119). In addition, Sigafoos (1995, p. 184) found that children with developmental disabilities need to be offered similar opportunities to use their communication as their typically developing peers; however, children with developmental disabilities frequently require more opportunities to practice emerging or newly acquired skills.

Implementation of AAC and other activities is often segmented in the schools. It has been noted that support of AAC is considered to be under the auspices of the SLP,

whereas curriculum modification and overall academic success is viewed as the teacher's domain (Hunt, et al., 2002, p. 34). These separations may result in disparate service provision with AAC equipment being available through the SLP, but knowledge of the curriculum being held by the teacher. Without collaboration, the SLP may not be able to program the device to meet the academic goals and needs of the student, while the teacher may be adapting the curriculum without a full understanding of the AAC supports available. Ehren (2000) indicated that teachers and SLPs must share the responsibility for student success. Each must be aware of the goals and techniques employed by the other. Both must consider the curriculum when developing goals. However, whereas the teacher may have greater expertise and knowledge of the curriculum, the SLP may have greater knowledge of speech-language development. It is the combination of these two skill sets that is likely to result in best teaching and therapy practices for students receiving speech services, especially those require AAC (Ehren). However, not all involved view these roles in the same way. Beck and Dennis (1997) observed that although teachers are acknowledged as being most responsible for knowing the curriculum, SLPs are typically seen as being most responsible for adapting the curriculum. It would appear that these two skills or subset of skills would lend themselves to cooperative teaming in order to adapt the general education curriculum to the needs of the student using AAC. However, as Beck and Dennis noted, adequate planning time continues to be problematic.

Ultimately, "the pervasive and critical role that language plays in school learning compounds the difficulty in differentiating the roles of the professionals who are involved

in its acquisition and use" (Ehren, 2000, p. 220). Although the need and effectiveness of AAC have been well documented, challenges continue to exist regarding implementing and teaching AAC skills. Students may use a variety of socially inappropriate behaviors as a means of expressing wants, needs, moods, thoughts or ideas. Replacing these challenging or inappropriate behaviors require consistency throughout the day, as well as replacement with an equally efficient, socially acceptable means of expression. For many students, AAC devices serve these roles (Johnston, et al., 2004). Clearly, AAC support cannot come from the SLP alone. "Adults can encourage speech and language skills during naturally occurring routines so that children practice communication skills even when the SLP is not working directly with the child" (Skau & Cascella, 2006, p. 13). For these opportunities to occur, AAC systems must be available and used throughout the day.

Best Practices: Teachers, Therapists and Students

Several researchers offered suggestions for skills necessary for the successful inclusion of students. Kent-Walsh and Light, (2003, p. 177) suggested that teachers develop AAC competencies, learn to match AT to activities and educate classmates on AAC. Suggestions for teams included consistent teaming practices, proper training of all team members, provide support to teacher, utilize appropriate transition plans and ensure selection of appropriate AAC for students. Kent-Walsh and Light (p.120) reported that in general, three major components are required for successful inclusion: effective

communication and collaboration, appropriate classroom support and teachers training and preparation time.

Ongoing support for the continued communicative development for a child with severe-profound impairments lies with the community in which the child lives. This need for support includes the home, school, social-leisure environments and other community places the child encounters (Depaepe, & Wood, 2001; Kaiser, et al 2001). In order for this goal to be achieved, communication partners require extensive training in the use and implementation of the child's AAC system.

McNaughton, et al (2008, p. 53-54) found that parents and researchers made several recommendations for service providers regarding best practice for AAC usage. These include the development of preservice training in current AAC devices and services for SLPs and teachers, use of evidence based practices within therapy and educational contexts and teaming and collaboration of team members. Sevcik, et al. (1999) noted that the use of five integrated components used at home and in school, resulted in increased functional communication skills with both familiar and unfamiliar people. These components included: the AAC system; customized symbol vocabulary placed on the AAC device; arranged, but natural opportunities for child to use AAC system; interaction with adults who used speech supplemented by visual symbols; and resources and feedback provided to parents and teachers.

Best practices would also incorporate AAC usage at home and in the community as well as in school. Skau and Cascella (2006) observed that SLPs, teachers and parents must work together to integrate AAC into the child's home and school settings. A

number of AAC systems are relatively easy to use. Teachers and parents should consider incorporating these systems into the child's routines to supplement communication and support the direct sessions provided by the SLP. However, Johnston, et al., (2003) noted that few studies on AAC usage have been conducted in inclusive settings.

Another aspect of best practice would be the implementation of information provided by individuals who use AAC. Adults who effectively use AAC as their primary means of communication were surveyed by Rackensperger, et al (2005). At that time, they reported that their input should be of utmost consideration when selecting and programming a communication device. Most of the participants reported that independent exploration of the AAC system was an integral part of learning how to use the system. However, they noted that this exploration was discouraged, if not admonished, by professionals in support roles. Rackensperger, et al., found that some participants noted that use of drill and practice was noted as essential for learning the system, yet others found drills and practice to be tedious and not an effective means of learning to use the system for effective, functional communication.

In addition, student AAC users should have greater role in decision making regarding AAC services, including assessment, type of device used and best training and support techniques. IEP goals should also be driven by the wishes of the student who uses the AAC device. Various service delivery models exist. Each has varying degrees of success; some are consumer driven, others follow a more traditional medical model approach (professional driven). Consumer driven services tend to result in increased

sense of empowerment and ownership of the device. Reed, et al. (1995) reported that consumer or student driven services and other factors increase AAC device usage.

AAC Barriers and Abandonment

McNaughton, et al., (2008, p. 46) noted several barriers to successful AAC usage, including lack of trained professionals (both teachers and SLPs), difficulties with physically implementing the device (access to the device as well as physically being able to use the device), limited community awareness/acceptance and time and effort to learn the device. It was noted that AAC device abandonment occurred because the parents did not have the necessary training to encourage, teach and enhance their child's use of the AAC device.

If professionals were not candid about the amount of time needed to learn how to use the device, the rate of device abandonment increased. Abandonment of an AAC device has varied implications for the family, including, but not limited to, exacerbation of the disability experienced by the child, escalation of personal and financial costs and inefficient use of service system resources (Parette et al., 2000, p. 178). Hutchins (2005, p. 49) indicated that if the family chooses not to use the AAC device at home, the child's ability to generalize skills to new environments and communication partners may be limited and the overall effectiveness of the device jeopardized.

Stephenson and Dowrick (2005) indicated that many parents were truly interested in using AAC with their children. However, other parents indicated that they understand their children and therefore did not need to use any form of AAC. This ability to

understand the family member resulted in lack of family support for AAC usage. Furthermore, parents frequently did not know how to use the various types of AAC systems provided to their children. Stephenson and Dowrick (2005, 0. 83) reported that "There is evidence that AAC assistive devices provided for children may be abandoned, at least in part because parents do not know how to use them."

Riemer-Reiss (2000) indicated that there is limited research available on the rate and reasons for AAC abandonment/discontinuance from the user's perspective. Therefore, a study was conducted to review continued use of various types of technology, including AAC, funded for individuals through a specific program (Colorado TechAct). Of the 136 pieces of equipment funded, 68% were still in use four to eight years later. However, this result also means that 32% were no longer in use; the reasons for discontinued usage were not provided (Riemer-Reiss). This information was supported by the findings of Philips and Zhoa (Hutchins, et al., 2005, p. 49), that "on average, one third of all assistive technology, including AAC devices, are abandoned (Philips & Zhoa, 1993)."

Family Perspectives

Collaboration is not only necessary for school staff, but for families as well. Collaboration is required to meet the needs of families of individuals who use AAC. This collaboration is typically done in early intervention, but this practice is not consistently used with older children or adults who use AAC, (Hutchins, et al., 2005, p. 49, as reported from Angelo, 2000). Some parents reported that they were the primary support

for their child's AAC development, whereas others reported the SLP or ATC provided the most support. McNaughton, et al., (2008) indicated that if AAC usage is to be encouraged teachers, SLPs and manufacturers need to be sensitive to needs of families as well as the individuals use will use the AAC system.

In addition, families need to be made aware of time and monetary commitment necessary on their part for successful AAC usage prior to obtaining a device for their child. Overall, informed families are key to AAC usage. Therefore, professionals need to be sensitive to the cultural differences and needs of families who support children who use AAC. Angelo (2004, p. 44), found that families also need to be counseled in realistic expectations of possible AAC outcomes and usage.

Another confounding issue is that children may learn one means of communication at school (e.g., sign language), but do not use the system at home. Stephenson and Dowrick (2005) observed that parents frequently reported that they understand their child at home and therefore did not need to use the systems developed at school. At other times, parents reported that the school was using a different means of communication than was being utilized at home (e.g., sign language in school and picture symbols at home). Some parents reported picture symbols to be impractical; however, the child was using picture based systems in school. Highly responsive parents and caregivers result in children who are more likely to use communication systems across environments.

Cultural and linguistic backgrounds of families influence their views and acceptance of AAC. Parette and McMahan (2002) reported that a lack of acceptance on

the part of the family and caregivers results in decreased opportunities to use the AAC system outside of the school setting. Family cooperation is essential to the successful use of the AAC system. Teams may need to alter their recommendations from a specific system to a system more acceptable to the family or modify treatment techniques to be more in alignment with family expectations. Parette and McMahan noted that family views regarding the child's independence, community acceptance, length of time to learn system and length of time until benefits/improvements are noted must be addressed by the IEP team members as part of the overall AAC assessment.

Literature Related to Methods

The use of Internet-based surveys has been increasing (Hewson, 2003; Solomon, 2001). It has been noted that although there are limitations, that often the advantages outweigh these limitations (Hewson, 2003; Solomon, 2001; Watt, 1997). Benefits cited include increase speed of creating, modifying and disseminating surveys; decreased cost in transmitting surveys; and increased ease of data collection and analysis (Hewson, 2003; Solomon, 2001; Watt, 1997). Ease of use for respondents was also noted by Solomon.

Limitations lie primarily in that fact that not everyone has a computer or use the Internet on a regular basis. These individuals, who may otherwise qualify as respondents to a survey, may be eliminated solely on the basis of their decreased computer access (Solomon, 2001; Watt 1997). Issues of sampling bias have been raised (DeMarrais, & Lapan, 2004; Solomon, 2001; Watt, 1997); however, Hewson (200) found that there was

little reliable evidence to support this concern. Overall, individuals who use technology on a regular basis are more likely to be comfortable using technology and recognize the speed and ease of completing and returning an Internet-based survey. Most professionals who use AAC would fall into this category.

Solomon (2001) noted that information and research conducted on more traditional survey techniques (postal mail surveys or telephone interviews) may not apply to Internet-based research. The ease of use of Internet surveys for respondents, respondents' ability to reply to the survey at any time of day and immediately submit their responses make the Internet unique when compared to telephone or postal surveys (Solomon). Ultimately, Andrews, Nonnecke and Preece (2003) found well designed Internet-based survey to be superior to traditional methods, resulting in increased response rates and speed of data collection.

A nominal scale Internet-based survey was chosen for this research for several reasons. The intent of the research is to answer "who is responsible for AAC implementation." The question itself calls for use of a nominal scale rather than a Likert or other type scale (Bell, 2005; DeMarrais, & Lapan, 2004; Denscombe, 2002; Lankshear, & Knobel, 2004). Identifying a single job classification or title will answer the research question whereas assigning a score to each job title will likely result in degrees of responsibility responses.

Other research designs and paradigms were considered and rejected. These include use of qualitative research designs, use of Likert scales and survey consisting of open ended questions. These were rejected in that very specific data is being sought

(Bell, 2005; DeMarrais, & Lapan, 2004; Denscombe, 2002; Lankshear, & Knobel, 2004). The other approaches lend themselves more to the collection of rich detail and varied opinions, but may not directly lead to indentifying the underlying cause of the problem (AAC devices are not being supported in the schools).

Conclusion

Reliance on information published in peer reviewed journals may contribute to the paucity of information available to those professionals responsible for providing AAC services. Access to these journals may be limited to those who are members of a specific group or to those willing to pay varying fees. The difficulty and cost (time and money) associated with finding research articles may discourage teachers and SLPs who would otherwise attempt to increase their knowledge and skill level with AAC. This difficulty may result in the use and application of information that is readily available (e.g., articles in professional journals to which the professionals subscribe or information presented via websites or conferences). As White, et al (2003) noted, "The barriers continue to be a lack of information and resources. And even if the resources are available, the information is often difficult to locate."

Chapter 3: Methods

Introduction

Teachers and speech language pathologists (SLPs) are called upon to complete a number of tasks within schools and classrooms. However, their views and perceptions regarding their ability to complete these tasks are not clear. Therefore, a survey of these professionals was conducted to begin to understand the perceptions of roles and responsibilities of teachers and SLPs regarding Augmentative alternative communication (AAC) usage. An Internet-based survey, designed to record responses to multiple-choice questions, was made available to school-based SLPs and teachers in the state of Mid Atlantic state. The Walden University Internal Review Board approval number for this study is 06-07-10-0350201.

The following sections contain descriptions of the research design, sample, data collection and analysis procedures. The Research Design and Approah section includes detailed description of and justification for the research design and approach, along with the research questions. This section is followed by a full description of the population, sampling method, sample size, participant eligibility criteria and characteristics of the selected sample. The Data Collection section consists of a description of the survey tool, concepts measured, validity and reliability information pertaining to the survey, instructions given to participants, location of raw data and description of data related to each variable. A copy of the survey questions is included in the appendix. The final section, analysis procedures, includes an explanation of the descriptive statistics, analysis

tools, data collection process, procedures for calculating scores and meaning of scores and results of a pilot study.

Research Design and Approach

This quantitative research study addressed the question: Who is responsible for implementing and supporting AAC in the classroom? The underlying hypothesis was that teachers and SLPs each believe the other should be providing primary AAC support. If each professional believes that it is the responsibility of the other to provide AAC support, there is a strong likelihood that needed support is not being provided to students. This belief in turn may result in decreased access to and use of AAC systems in classrooms.

It was hypothesized that each professional (SLP or teacher) perceives many aspects of AAC implementation and support to be the responsibility of the other professional. More precisely, the null hypothesis (H_o) was: There is no difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom. The alternative hypothesis (H_1) was: There is a difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom.

Two additional questions were considered:

1. What are the current responsibilities of teachers and SLPs for the support and implementation of AAC in the classroom?
2. What are the perceived responsibilities of teachers and SLPs for the support and implementation of AAC in the classroom?

Responses to these questions offered insight into the views of the teachers and SLPs responding to the survey regarding support of AAC in the classroom.

A causal-comparative research design was used for this research project. This design encompassed the use of "if . . . then" concepts, allowing for the influence of membership of a group, such as teacher or SLP, to be compared to the responses of members of a different group. Therefore, the independent variable of teacher or SLP was considered as an influencing factor in how each participant responds to a question. The dependent variable was perception of responsibility.

The survey was designed to be self-guided. Participants were able to complete the survey at their own pace, offering participants the opportunity to provide thoughtful responses without the potential for influence from the physical presence of an examiner.

This paradigm and accompanying design allowed for teachers and SLPs in various locations to respond to the survey. Use of an Internet-based survey allowed for the inclusion of a large number of people, while keeping the focus on specific concepts. The survey was available online for a 4-week period. It was observed during the pilot survey that participants choosing to respond did so within 2-days of receiving the introductory e-mail and consent form. Andrews, et al., (2003b) noted that web-based surveys are typically completed more quickly than postal or e-mail surveys. Limiting the availability to the survey to a four week period was not anticipated to negatively impact response rate. However, reminder e-mails were sent to projected participants 1, 2 and 3-weeks after the initial invitation had been sent. This format and timeframe allowed for

inclusion of participants who may have been unavailable during the week following the first contact.

Use of a security password helped ensure that participant confidentiality was maintained. Furthermore, the site used to create the survey (Survey Monkey) has been used by various organizations, increasing the likelihood of participant familiarity with the tool. This familiarity may also have increased response rate (Andrews, et al., 2003b). In that confidentiality was maintained and participants were able to end their participation at any time, there were no ethical concerns pertaining to use of this format.

Other paradigms and designs considered, such as collective case study or test-retest designs, were rejected in that they lacked sufficient controls to address threats to internal validity (Bell, 2005; DeMarrais, & Lapan, 2004; Denscombe, 2002; Lankshear, & Knobel, 2004). Although information collected from interviews and other qualitative methods would have provided rich detail, the purpose of this study was to gather specific pieces of information. A qualitative study approach would have lent itself more to the gathering of diverse thoughts and opinions, but could have included ideas introduced by participants that were not being addressed by this study (Creswell, 2003; Mills, 2007). Therefore, a quantitative design was more appropriate to the type of questions and response sets utilized.

Setting and Sample

Population

The focus population consisted of teachers and speech-language pathologists based in one Mid Atlantic state, who work with students who use AAC. The regulations this Mid Atlantic state require that teachers be certified and SLPs be licensed by the state or certified by the American Speech-Language Hearing Association (ASHA). There are approximately 516 National Board for Professional Teaching Standards (NBPTS) certified, licensed teachers and 335 ASHA certified, state licensed speech-language pathologists in the focus state.

Teachers and SLPs based in the targeted Mid Atlantic state, who were practicing in their respective fields and who interacted with students who use AAC comprised the population for this study. It was important that individuals who work with students who use AAC were the primary focus of this study. Feedback from the pilot study revealed that those who are not currently involved with at least one student using AAC declined participation in the study in that they did not believe that it was pertinent to his or her position. Therefore, a census was used for the current study. Literature review suggested that teachers and speech language pathologists may have the most interaction with students who use AAC in school settings (Johnson, et al., 2006; Sonnenmeier, McSheehan, & Jorgensen, 2005). This idea may be further supported by position statements obtained from the Council for Exceptional Children (CEC; http://www.cec.sped.org/Content/NavigationMenu/ProfessionalDevelopment/Professiona

lStandards/Initial_Content_Standards.doc) regarding teacher training and from the American Speech-Language Hearing Association (ASHA) position statement regarding the role of the SLP in implementation of AAC in schools and across the life span (ASHA, 2005).

School staff from this Mid Atlantic state were selected in order to decrease the influence of conflicting state policies and procedures on participant responses (e.g., school policy/procedure in that state may differ from policy/procedure in surrounding states). Both special and general education teachers were included. General education teachers may have worked with a student who used AAC and was fully included in general education settings. Special education teachers may have had involvement with a greater variety of communication systems, increasing their exposure to multiple types of AAC.

Although level of education, experience in the field and experience with communication devices was collected, inclusion in the study was not dependent on these factors. Those willing to participate in the survey were included. Sample and sample size were determined by the constant contact member list of the technology advocacy and support center partnering in this study. There were 2,039 e-mail addresses on the technology advocacy and support center constant contact list. At that time, there were 258 SLPs and 561 teachers.

Sample

A census of the a technology advocacy and support center membership on the constant contact list was conducted. Although the survey was open to all members on the constant contact list, only teachers and SLP were targeted. In that a census was taken, no sample size could be predetermined. In order for the results to be considered statistically significant, a minimum of 257 of the 2039 members needed to respond. This would provide a confidence level of 95% and confidence interval of $\pm$ 5 for statistical calculations. Results of this study cannot be generalized to the general population secondary to the use of census rather than sampling, as well as having limited participants to those providing services in one geographic area.

Instrumentation and Materials

The survey tool used was based on the survey utilized by Locke and Mirenda (1991). The Locke and Mirenda survey is robust, containing questions that are not part of the focus of this study. The Locke and Mirenda survey consisted of 30 questions, with six questions containing between 17 and 30 subquestions, for a total of more than 150 questions. The Locke and Mirenda survey was revised by myself and dissertation chairperson. An Internet-based survey consisting of five sections was developed. These sections included: background information, current roles and responsibilities, suggested roles and responsibilities, current training needs and availability of professional staff. Overall, 17 core questions preceded by five background questions were presented in the survey.

Categorical data, in this case five distinct job titles, wer used to keep the focus narrow, decreasing the likelihood of outlying responses. Job titles of professionals who typically provide primary (teaching) or related services (therapy) in schools were listed as response choices to the core questions.

Reliability

Internal reliability of the survey items was determined using data collected from the pilot survey. A total of 25 cases were entered into SPSS (Statistical Package for the Social Sciences) 18.0 for Windows Student Version. Of these cases, four were not considered to be valid due to lack of response on all 14 items. The remaining 21 cases were analyzed. The results yielded a Cronbach's alpha of .937 and a corresponding Cronbach's alpha based on Standardized items of .939. The results were indicative of a high degree of internal consistency. Instructions for calculating Cronbach's alpha using SPSS can be found in the instructions or help sections of the software.

Validity

Survey validity was established through peer review completed by three experts in the field of AAC. Each of the experts was e-mailed a text copy of the survey with the instructions "to indicate what you think each question is asking." Each of the experts provided written responses on the text copy of the survey provided. Expert responses were typed in red, bold red or purple font below each of the questions. Definitions were included on the text survey.

Overall, the experts indicated that the questions were clear and noted that they were "practically restating the question" in order to indicate what was being asked. There was agreement across experts regarding the nature of each question. For the two core sections (Section 2: Current Responsibilities and Section 3: Suggested Responsibilities) two of the experts defined the meaning of the two main instruction. The third expert added additional comments and defined each question; however, each definition began with the same phrase. Survey section number and instructions as provided on the survey are listed below, followed by sample comment from one of the experts:

Section 2: For each question, check one choice. If decisions are made by a team, check the team member who makes the final decision. In your school(s), who is primarily responsible to:

Expert 3 response: You are asking me to choose from below who I believe is primarily responsible to make the FINAL decision

Section 3: For each question, check one choice. If team, check the choice you feel should be most responsible. Who do you think should be primarily responsible to:

Expert 2 response: These questions are asking what person on the team does the person completing the survey believe should make the decisions below

Section 5 (Availability of professional support staff) was also addressed through single sentence responses from each expert:

Expert 1 response: How frequently are the following professionals present in your building, whether or not they work with your students.

Sections 1 and 4 addressed demographic information (section 1) and barriers to AAC support (section 4). The three experts were in agreement that the questions clearly asked for specific pieces of information. It should be noted that the third expert indicated that parents should be included as one of the people responsible for AAC support services (parents should have been included as an independent variable). However, since parents are not consistently school employees, they were not included on this survey. No modifications were considered necessary based on expert review of the survey.

Pilot Survey and Modifications

A pilot of the revised survey was conducted in one Mid Atlantic state. Responses on the pilot study resulted in six questions being added to the survey. No questions were removed. Although the participants most likely work in that state, it is possible that they provide services in one of the neighboring states, therefore a question regarding the state of employment was added to the survey Background section. In addition, a question regarding the state in which the highest level of education was added to account for differences that may result from the views of the training institution.

Overall, both teachers and SLPs noted that assistive technology coordinators (ATCs) were either responsible for some support services or that they should be responsible for some support services, (raw data from the pilot survey is provided in the Data Collection and Analysis section of this chapter). However, it was not clear how often the ATC is available to provide services to students. Therefore, one additional question was added to the fourth portion of the survey. This question pertained to the

frequency of availability of the ATC within the participant's school (daily, weekly, monthly, quarterly, annually or I don't know). In order to decrease the potential to lead the participants' responses, this question was also posted regarding the frequency of occupational, physical and speech-language therapists' availability.

Scores were collected using nominal scale. Job categories/titles were provided as response choices. These included assistive technology coordinator (ATC), occupational therapist (OT), speech language pathologist (SLP), physical therapist (PT) or teacher. A description of each job was provided at the beginning of the survey in order to ensure consistent use of terminology.

The independent variable in this study was job title of the participants (teacher or SLP). Teacher was defined as an individual who was trained and certified or licensed in the area of instructing students aged three to 21 years old. Training may have been in specific subject matter (e.g., math, reading, or science), grade level (e.g., kindergarten, second grade, or high school) or in special education. This group was further refined to general education, special education teacher of students with mild to moderate disabilities and special education teachers for students with severe to profound disabilities. An SLP was defined as an individual licensed or certified to address the communication needs of individuals with limited or insufficient ability to effectively communicate with others. Additional categorical dependent variables were the perceptions of current responsibilities (the professional who currently provides AAC support services), projected responsibilities (the professional who would be most appropriate to provide

support services), types and number of courses in AAC (workshop, self-study, college level courses, etc) and length of time providing services (stated in years).

Data Collection

Individuals who were licensed and/or certified in their professional field were contacted via e-mail. These professionals were contacted directly by the technology advocacy and support center that partnered in this study. Members of this group were actively engaged in the use and advancement of AAC for all individuals. This criteria decreased the possibility of no responses/poor response rate secondary to lack of active involvement with students using AAC. The technology advocacy and support center is well established and maintains member confidentiality. All eligible members were offered the opportunity to participate in the study. An e-mail blast was sent to the constant contact list requesting participation in the study. Follow-up reminder e-mails were sent at 1-week intervals for a period of 3 weeks to encourgae participation of nonrespondants. Andrews, et al., (2003b) noted that any additional contact may be viewed negatively. In addition, while the use of the constant contact list ensured participant confidentiality, it also restricted the type of contact that can be made.

Participants self-identified with one of the two main groups. Responses from other members of the technology advocacy and support center who were not teachers or SLPs were sorted out and were not included in the analyzed data.

Pilot Survey Data Analysis

Participant responses were separated into two categories: responses of teachers and responses of SLPs. The responses for each of the two groups to each of the core questions were tallied for each of the categories provided in the survey (ATC, OT, SLP, PT or Teacher). The manner in which the teachers and SLPs responded meant that they believed that the identified professional (AT, OT, SLP, PT or Teacher) was either currently responsible for the specified AAC support (survey section 2) or that they should be primarily responsible for the specified AAC support (survey section 3). These scores were then compared using chi squared test. Raw data was reported in table format in the Data section, followed by results of the chi square tests. The significance of the results and the compared data will be considered in the Discussion section.

Results of Pilot Survey

A pilot survey was sent to 20 SLPs and 20 teachers licensed or certified in Mid Atlantic state. Within 24 hours, 10 responses were received. Two respondents (one SLP and one teacher) indicated that they were not currently involved in the provision of AAC services and therefore declined participation. After a 1-week period, a follow-up e-mail was sent to all but the two participants who had declined participation, reminding the participants of the survey. This resulted in a total of 21 responses (11 SLPs and 10 teachers). Overall, 50% of teachers and 90.9% of SLPs indicated that they had some training in the area of AAC. Of the 15 professionals who had received training, 73.3% reported taking a 1-8 hour workshop.

Raw data collected for the core questions are recorded in Tables 1 and 2. It should be noted that one SLP did not respond to any of the questions other than the background information. Table 2 contains responses based on current roles and responsibilities. Responses from both teachers and SLPs indicate that it is not the role of the teacher to determine which device is appropriate or to seek funding. Both agreed that these are responsibilities of the ATC or SLP; however, more teachers (70%) noted that SLPs determine which device is appropriate and obtain funding than reported by SLPs (40%). Regarding vocabulary selection and construction of overlays/symbols, 70% of teachers noted that this task is their responsibility, while SLPs reported that these were part of their responsibilities at a level of 80% and 70% respectively. Both teachers and SLPs reported that the responsibility to make sure the device is ready for use lies with ATC (20% of teachers, 40% of SLPs), teacher (40% of teachers, 10% of SLPs) or the SLP (40% of teachers, 50% of SLPs).

This response pattern may be reflective of differing staffing patterns, district policies or other factors not listed in the survey. Most teachers (90%) reported that it is their responsibility to make sure the student uses the device; 60% of SLPs reported that this activity is the teachers' responsibility. Device maintenance and updating was reported by 60% of teachers to be their responsibility, while the remaining 40% noted it was the SLPs' responsibility. Conversely, 40% of SLPs reported this task to be a responsibility of the ATC, 10% noted it was the teachers' responsibility and the remaining 50% stated that it was their responsibility.

Responses to the core questions based on teacher and SLP opinion as to who should be responsible for different aspects are provided in Table 2. Large differences were noted in the responses of teachers and SLPs regarding who should be responsible for deciding which device is appropriate and obtaining funding; 70% of teachers indicated that the SLP should be responsible, while 70% of SLPs indicated that the ATC should be responsible. Sixty percent of teachers noted that they should be responsible for vocabulary selection; 80% of SLPs reported that they should have that responsibility. Overlay and symbol creation was considered to be the responsibility of teachers by 70% of the teachers, while 70% of SLPs indicated that this activity should be their responsibility.

The responsibility for ensuring that the device was ready for use yielded more similarities than differences. Teachers reported this activity to be the responsibility of the ATC at 11.1%, teachers 44.4% and SLPs 44.4%. SLPs reported that the ATC should be responsible 30%, teachers 30% and SLPs 40%. Both teachers and SLPs noted that the teacher should be responsible to make sure the student used the device at a rate of 70%. Regarding device maintenance and updating, 50% of teachers reported that they should be responsible and 40% of teachers noted that the SLP should be responsible. Sixty percent of SLPs reported that this maintenance and updating should be their responsibility while 30% of the SLPs noted that the ATC should be responsible.

Three teachers and nine SLPs reported that they needed additional training or support in order to provide AAC services and support. Both groups of professionals noted a need for increased knowledge of AAC devices, knowledge of funding and

strategies to incorporate the device into the curriculum. SLPs also indicated a need to have increased training in strategies to incorporate the device into the classroom and how to prepare/set-up the device for use in the classroom.

In that the sample size is quite small, result of this pilot survey should be considered with caution. According to the Speech-Language Hearing Association of the state in which the survey was conducted, there are 612 licensed SLPs in the state who are also members of the state association. There may be additional licensed professionals who are not members of the state association. Ten participants represent approximately 1.6% of the professionals. In addition, the National Board for Professional Teaching Standards reports 1367 licensed teachers in the state in which the survey was conducted. Ten participants represent just over 1% of the professionals. These percentages do not constitute a significant portion of the fields. In order for these numbers to reach a confidence level of 95, with a confidence interval of $\pm$ 5, there would have to have been 236 SLPs participating and 300 teachers participating. The sample in the pilot was small and the results should not be generalized to the large population of professionals.

Table 1

Who is Responsible to:

	ATC	Teacher	SLP	TOTAL
Decide which device is appropriate for the student?				
Teacher	30% (3/10)		70% (7/10)	100%
SLPs	60% (6/10)		40% (4/10)	100%, 1NR
Seek funding for the device?				
Teacher	30% (3/10)		70% (7/10)	100%
SLPs	66.7% (6/9)		33.3% (3/9)	100%, 2 NR
Decide on device vocabulary?				
Teacher	10% (1/10)	70% (7/10)	20% (2/10)	100 %
SLPs	20% (2/10)		80% (8/10)	100%, 1 NR
Create overlays/symbols for the device?				
Teacher		70% (7/10)	30% (3/10)	100%
SLPs	20% (2/10)	10% (1/10)	70% (7/10)	100%, 1 NR
Make sure device is ready for use?				
Teacher	20% (2/10)	40% (4/10)	40% (4/10)	100%
SLPs	40% (4/10)	10% (1/10)	50% (5/10)	100%, 1 NR
Make sure student uses the device?				
Teacher		90% (9/10)	10% (1/10)	100%
SLPs		60% (6/10)	40% (4/10)	100%, 1 NR
Update and maintain the device?				
Teacher		60% (6/10)	40% (4/10)	100%
SLPs	40% (4/10)	10% (1/10)	50% (5/10)	100%, 1 NR

NR = no response

Table 2

Who Should be Responsible to:

	ATC	Teacher	SLP	TOTAL
Decide which device is appropriate for the student?				
Teacher	20% (2/10)	10% (1/10)	70% (7/10)	100%
SLPs	70% (7/10)		30% (3/10)	100%, 1 NR
Seek funding for the device?				
Teacher	30% (3/10)		70% (7/10)	100%
SLPs	70% (7/10)		30% (3/10)	100%, 1 NR
Decide on device vocabulary?				
Teacher		60% (6/10)	40% (4/10)	100%
SLPs	20% (2/10)		80% (8/10)	100%, 1 NR
Create overlays/symbols for the device?				
Teacher		70% (7/10)	30% (3/10)	100%
SLPs	30% (3/10)		70% (7/10)	100%, 1 NR
Make sure device is ready for use?				
Teacher	11.1% (1/9)	44.4% (1/9)	44.4% (1/9)	100%, 1 NR
SLPs	30% (3/10)	30% (3/10)	40% (4/10)	100%, 1 NR
Make sure student uses the device?				
Teacher	10% (1/10)	70% (7/10)	20% (2/10)	100%
SLPs		70% (7/10)	30% (3/10)	100%, 1 NR
Update and maintain the device?				
Teacher	10% (1/10)	50% (5/10)	40% (4/10)	100%
SLPs	30% (3/10)	10% (1/10)	60% (6/10)	100%, 1 NR

NR = no response

Table 3

Current Training Needs

	Teacher	SLP	TOTAL
Knowledge of available devices	1/3	2/9	12
Knowledge of funding	1/3	1/9	12
Strategies to incorporate device into curriculum	1/3	2/9	12
Strategies to incorporate device into general classroom activities		1/9	9
How to prepare/set-up the device for use in the classroom		3/9	9

Protection of Participants' Rights

Participants' rights were explained in an introductory e-mail prior to beginning the survey. No identifying information was collected (e.g., names, addresses, e-mail addresses, etc.). Participants had the ability to end their participation at any time by closing the window on their browser. Information regarding illegal activity was not included in this survey. Vulnerable populations were not targeted in participant sampling. In addition, access to the raw data was password protected. Results of the study were shared with the technology advocacy and support center membership, but no identifying information was provided.

Summary

Participants were contacted by a technology advocacy and support center through the Internet and asked to complete a short, five minute survey. They were able to end their participation at any time. Results of responses to 21 core questions were compared and analyzed using SPSS Student Pack, version 18.0 software. Chi square test was conducted using the SPSS software. Results were analyzed to determine differences and degree of differences to survey responses.

Chapter 4: Results

The roles of teachers and SLPs continue to change over time. Their views as to who is responsible and who should be responsible for specific tasks may directly impact services provided to students who rely on AAC devices. This chapter contains the results obtained from a survey designed to gather information regarding AAC support services in the classroom. The chapter is organized based on the research questions. A review of the study is provided. Demographic information is presented, followed by Survey results and Analysis. Information pertaining to gaps in training and then barriers to task implementation is followed by the chapter summary.

The main research question for this study was: Who is responsible for implementing and supporting AAC in the classroom? An additional question addressed in this study was: Is there a difference in the views of SLPs and the views of teachers regarding who should be responsible for AAC support in the classroom?

It was hypothesized that each professional (SLP or teacher) perceives many aspects of AAC implementation and support to be the responsibility of the other professional. More precisely, the null hypothesis (H_o) was: There is no difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom. The alternative hypothesis (H_1) was: There is a difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom.

In order to answer the two research questions, two additional questions needed to be considered:

1. What are the current responsibilities of teachers and SLPs for the support and implementation of AAC in the classroom?
2. What are the perceived responsibilities of teachers and SLPs for the support and implementation of AAC in the classroom?

Determining who was currently responsible and who should be responsible offered insight into the views of the teachers and SLPs responding to the survey.

Results of Survey

Response Rate

An invitation to participate in the survey was sent to all members on the technology advocacy and support center constant contact list. At the end of the first week, a total of 196 of 774 possible responses had been received. Three follow-up letters were sent at 1-week intervals; letters were sent via e-mail through the constant contact list maintained by the technology advocacy and support center. These follow-up letters increased responses by 41 for the first letter, 21 for the second and four for the final letter. A total of 262 people responded. Of those respondents, 14 were not eligible to participate. Overall, 96 teachers and 152 SLPs participated in the survey. A 30% response rate was achieved. Response rate may have been impacted by the time of year in which the study was conducted (late June and early July when the schools in this Mid Atlantic state close out the school year and open extended school year). In addition, some eligible participants may not routinely check their e-mail or may simple delete e-mails without first checking their contents. Furthermore, some eligible participants may

not have viewed this issue as a concern and ultimately may have decided not to participate. Table 4 displays response rate following each contact.

Table 4

Response Rate

Title	Invitation	First follow-up	Second follow-up	Third follow-up	Totals
SLP	120	26	4	2	152
Teacher	71	13	12	0	96
Other	5	2	5	2	14
Totals	196	41	21	4	

Participants

Most of the participants had obtained a master's degree as their highest level of education (140 SLPs and 81 teachers). Of the remaining SLPs seven had obtained a doctorate degree and four had obtained additional degrees not related to health or education; the one remaining SLP did not respond to this question. Thirteen of the teachers had achieved a bachelor's degree as their highest level of education, two had earned their doctorate degree and one had additional education which they did not specify. One teacher responded to this question twice. Table 5 contains educational levels compared with job titles.

Table 5

Highest Level of Education

	SLP		Teachers	
Degree	Number	Percent	Number	Percent
Bachelor's	0	0.0%	13	13.5%
Master's	140	92.1%	81	84.3%
Doctorate	7	4.6%	2	2.0%
No response	1	0.65%	0	0.0%
Other	4	2.6%	1	1.0%

The participants attended colleges and universities in a variety of states. Bachelor degrees where conferred from institutions in 27 states, master degrees from 21 states and doctorates from four states. The state in which the most participants attended college was Maryland for all three types of degrees (61 participants earned their bachelors, 75 earned their masters and three earned their doctorate in the state of Maryland). It should be noted that although many teachers have a master's degree, a bachelor's degree is the minimum entry level requirement for teachers in the targeted state; however, all teachers must be certified and earn a master's degree within 5-years.

Reported areas of study revealed some diversity. Speech language pathology was reported to be the major area of study by 149 participants. Of the 96 teachers participating, 85 reported special education as their major area of study. The next most highly reported areas of study were elementary education (25 participants), general education (14 participants) and prekindergarten (10 participants). Specific areas of disability were the major area of study for 29 participants (learning disabilities, emotional disabilities, autism spectrum disorders, vision, deaf/hard of hearing and severe and

profound disabilities). In addition, four participants reported majoring in kindergarten education and five majored in secondary education. Area of study reported by discipline is noted in Table 6.

Table 6

Major Area of Study

	SLP		Teacher	
Area of study	Number	Percent	Number	Percent
Speech language pathology	149	98.%	0	0.0%
Special education	0	0.0%	85	88.5%
General education	0	0.0%	14	14.6%
Learning disabilities	0	0.0%	4	4.1%
Emotional disabilities	0	0.0%	5	5.2%
Autism spectrum disorders	0	0.0%	7	7.3%
Prekindergarten	0	0.0%	10	10.4%
Kindergarten	0	0.0%	4	4.1%
Elementary education	0	0.0%	25	26.0%
Secondary education	0	0.0%	5	5.2%
Subject:				
Vision	0	0.0%	6	6.2%
Deaf/HH	1	0.6%	1	1.0%
Audiology	1	0.6%	0	0.0%
Birth – 5	0	0.0%	1	1.0%
Communicative disorders	1	0.6%	0	0.0%
Early childhood SPED	0	0.0%	2	2.0%
Educational technology	0	0.0%	2	2.0%
English	0	0.0%	1	1.0%
History	0	0.0%	1	1.0%
Counseling psychology	0	0.0%	1	1.0%
Psychology	0	0.0%	3	3.1%
Severe and profound	0	0.0%	3	3.1%

Most of the participants reported 11 or more years of experience working in a school (147; 54 teachers and 93 SLPs), while 35 (10 teachers and 25 SLPs) reported 6 – 10 years of school-based experience. An additional 31 participants had 3 -5 years of

school-based experience (14 teachers and 17 SLPs) and 20 (13 teachers and seven SLPs) had 2 years or less of school-based experience. Fifteen participants did not respond to this question. Summary of years of experience working in a school is listed in Table 7.

Table 7

Years of Experience Working in a School

	SLP		Teacher		Total	
Yrs experience	Number	Percent	Number	Percent	Number	Percent
0 – 2 years	7	4.6%	13	13.5%	20	8.1%
3 – 5 years	17	11.2%	14	14.5%	31	12.5%
6 – 10 years	25	16.4%	10	10.4%	35	14.1%
11 or more years	93	61.2%	54	56.3%	147	59.3%
skipped	10	6.6%	5	5.2%	15	6.0%

Eighty-six participants (25 teachers and 61 SLPs) reported 11 or more years of experience working with at least one student who was nonverbal, while 49 (17 teachers and 32 SLPs) reported 6 – 10 years of experience working with at least one student who was nonverbal. Forty-six participants (23 teachers and 23 SLPs) indicated they had 3 -5 years of experience working with at least on student who was nonverbal and 63 (35 teachers and 28 SLPs) had two years of experience or less of working with a student who was nonverbal. Eleven participants did not respond to this question. Table 8 contains a comparison of years of experience with students who were nonverbal to discipline.

Table 8

Years of Experience with One or More Student Who Was Nonverbal

	SLP		Teacher		Total	
Yrs experience	Number	Percent	Number	Percent	Number	Percent
0 – 2	28	18.4%	32	33.3%	60	24.2%
3 – 5	23	15.1%	23	23.9%	46	18.4%
6 – 10	32	21.0%	17	17.7%	49	19.7%
11 or more	61	40.1%	24	25.0%	85	34.3%
skipped	8	5.3%	0	0.0%	8	3.2%

Overall, 151 SLPs and 56 teachers indicated that they had some training in the area of AAC. The amount of AAC training received is noted in Table 9.

Table 9

AAC Training Received

	SLP		Teacher		Total	
Training	Number	Percent	Number	Percent	Number	Percent
1college course	39	25.6%	22	23.0%	61	23.3%
2 or more college courses	27	17.8%	24	25.0%	51	19.4%
1-8 hour workshop	71	46.7%	47	49.0%	118	45.0%
1-3 day workshop	43	28.3%	32	33.3%	75	28.6%
1-4 presentations at a conference	45	29.6%	12	12.5%	57	21.7%
5 or more presentations at a conference	31	20.4%	24	25.0%	55	20.9%
Read 1 book about AAC (Beyond college course requirements)	17	11.2%	12	12.5%	29	11.0%
Read 2 or more books about AAC (Beyond college course requirements)	41	27.0%	22	23.0%	63	24.0%

Other means of learning about AAC were reported to be on the job training, observations, participation in AAC assessments, internships, reading journals, direct training from AAC manufacturers, hands on experiences and use of case studies.

Analysis of Views Between Professions

Who is Responsible for Implementing and supporting AAC in the Classroom?

The first set of survey questions addressed the main research question: who is responsible for implementing and supporting AAC in the classroom? Seven tasks necessary for AAC support and implementation were included in the survey. In order to determine which team member was currently the primary member responsible for completing each of the seven core tasks, participants were asked to respond to the series of questions. Pearson chi square tests were conducted to compare the responses of the teachers to the responses of the SLPs and current roles to perceived roles within each profession.

Results indicated that the professional responsible for support and implementation of AAC in the classroom was dependent upon the task being addressed. More specifically, the assistive technology coordinator (ATC) was generally responsible for determining which device was most appropriate for the student and obtaining funding. Typically, the SLP or the teacher was responsible to decide on vocabulary, create overlays/symbols for the device, make sure the device is ready for use, ensure the student used the device and to update and maintain the device. Detailed description and analysis

for each of the seven questions regarding current responsibilities can be found in the following sections.

Survey Question One: Who is currently responsible to decide which device is appropriate for the student?

A majority of SLPs, 92 of 152 (60.5%) noted that the ATC was responsible for device selection. Forty-two SLPs (27.6%) reported that they were currently responsible for device selection. Three SLPs reported that the teacher was currently responsible for device selection (2.0%). The remaining 15 SLPs did not respond to this question.

Overall, 39 of 96 (40.6%) teachers reported that the ATC was responsible for device selection, while 31 (32.3%) reported the SLP as responsible. In addition, 15 teachers reported device selection to be their responsibility (15.6%), while two teachers (2.1%) indicated that the physical therapist (PT) was responsible for device selection. Nine teachers did not respond to this question.

Both teachers and SLPs indicated that device selection was currently the responsibility of the ATC or SLP. Table 10 contains the results for this question. The Pearson chi-square test for the question resulted in a value of 23.135, with four degrees of freedom. A significance level of 0.0 α was obtained. This indicated that job title (teacher or SLP) did not directly impact responses.

Table 10

Who is Currently Responsible to Decide Which Device is Appropriate for the Student?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	15	9.9%	9	9.4%	24	9.7%	
ATC	92	60.5%	39	40.6%	131	52.8%	
PT	0	0.0%	2	2.1%	2	0.8%	
SLP	42	27.6%	31	32.3%	73	29.4%	
Teacher	3	2.0%	15	15.6%	18	7.3%	
Total	152	100%	96	100%	248	100%	21.135

Survey Question Two: Who is currently responsible to seek funding for the device?

Seeking funding for a device was noted by 105 SLPs (69.1%) to be the responsibility of the ATC. An additional 27 SLPs (17.8%) reported seeking funding to currently be their responsibility. One SLP (0.7%) reported that the teacher was responsible to seek funding. Nineteen SLPs did not respond to this question.

Fifty-four teachers (56.3%) reported seeking device funding to be the responsibility of the ATC. Another 26 teachers (27.1%) reported that the SLP was responsible for seeking funding; five teachers noted that they were responsible for obtaining funding (5.2%). Eleven teachers did not respond to this question.

The Pearson chi-square value for these results was 8.991, with three degrees of freedom. A significance level of 0.029 α was obtained. This indicated a high degree of

agreement between the two disciplines as to who was responsible to seek funding for AAC devices. Table 11 contains responses compared to discipline.

Table 11

Who is Currently Responsible to Seek Funding for the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	19	12.5%	11	11.5%	30	12.1%	
ATC	105	69.1%	54	56.3%	159	64.1%	
SLP	27	17.8%	26	27.1%	53	21.4%	
Teacher	1	0.7%	5	5.2%	6	2.4%	
Total	152	100%	96	100%	248	100%	8.991

Survey Question Three: Who is currently responsible to decide on device vocabulary?

Ninety-three SLPs (61.2%) noted vocabulary selection as currently being their responsibility. Twenty-six SLPs (17.1%) reported that the teacher was currently responsible for selection of vocabulary; 19 SLPs (12.5%) reported that the ATC was currently responsible. Fourteen SLPs did not respond to this question.

Conversely, 51 teachers (53.1%) indicated that they were currently responsible for vocabulary selection. Another 25 teachers (26%) reported that the SLP was responsible for vocabulary selection. Ten teachers (10.4%) noted that the ATC was

currently responsible for vocabulary selection. Ten teachers did not respond to this question.

The majority of responses for both SLPs and teachers indicated that each professional was currently responsible for vocabulary selection. The Pearson chi-square value of 40.166 indicated that there is disparity between the disciplines as to who is currently responsible for vocabulary selection. Responses compared to discipline are reported in Table 12.

Table 12

Who is Currently Responsible to Decide on Device Vocabulary?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	14	9.2%	10	10.4%	24	9.7%	
ATC	19	12.5%	10	10.4%	29	11.7%	
SLP	93	61.2%	25	26.0%	118	47.6%	
Teacher	26	17.1%	51	53.1%	77	31.0%	
Total	152	100%	96	100%	248	100%	40.166

Survey Question Four: Who is currently responsible to create overlays/symbols for the device?

The majority of SLPs noted the creation of overlays/symbols (pages used on an AAC device or the two dimensional visual representation of nouns, verbs and other parts of speech) to currently be their responsibility. Overall 95 SLPs (62.5%) reported that

they were currently responsible for creating overlays/symbols for the device. Twenty-five SLPs (16.4%) reported that the ATC was currently responsible to create overlays/symbols for the device; 15 SLPs (9.9%) reported the teachers to be responsible for this task. One SLP (0.7%) reported that the Occupational Therapist (OT) was responsible for overlay/symbol creation. Eleven SLPs did not respond to this question.

A total of 46 teachers (47.9%) reported that they were responsible for overlay/symbol creation. Twenty-five teachers (26.0%) reported that the SLP was responsible for overlay/symbol creation; 14 teachers (14.6%) reported that the ATC was responsible for overlay/symbol creation. Sixteen teachers did not respond to this question.

A Pearson chi-square value of 51.602 was obtained for this question, with four degrees of freedom. A significance level of 0.0 α was obtained. This was indicative of a strong relationship between profession and task responsibility. Specifically, teachers noted that this was their responsibility, while SLPs indicated that they were responsible for overlay/symbol creation. Results are listed in Table 13.

Table 13

Who is Currently Responsible to Create Overlays/Symbols for the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	16	10.5%	11	11.5%	27	10.9%	
ATC	25	16.4%	14	14.6%	39	15.7%	
OT	1	0.7%	0	0.0%	1	0.4%	
SLP	95	62.5%	25	26.0%	120	48.4%	
Teacher	15	9.9%	46	47.9%	61	24.6%	
Total	152	100%	96	100%	248	100%	51.602

Survey Question Five: Who is currently responsible to make sure the device is ready for use?

Ensuring the device was ready for the student to use was currently the responsibility of 64 of the SLPs (42.1%). Forty SLPs (26.3%) reported that the ATC was currently responsible to make sure the device was ready for use; 30 SLPs (19.7%) noted that the teacher was responsible for making sure the device was ready for use. Two SLPs (1.3%) indicated that the OT was responsible to make sure the device was ready for use. Sixteen SLPs did not respond to this question.

However, 47 teachers (49.0%) indicated that they were currently responsible to ensure the device was ready for use by the student. Twenty teachers (20.8%) noted that the SLP was responsible to make sure the device was ready for use by the student; 17

teachers (17.7%) reported that the ATC was responsible to make the device ready for use. One teacher (1.0%) indicated that the OT was responsible to make sure the device was ready for use. Eleven teachers did not respond to this question.

Pearson chi-square value of 26.023, with four degrees of freedom indicated that there is some correlation between discipline and response. A significance level of 0.0 α was obtained. Results are provided in Table 14.

Table 14

Who is Currently Responsible to Make Sure the Device is Ready for Use?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	16	10.5%	11	11.5%	27	10.9%	
ATC	40	26.3%	17	17.7%	57	23.0%	
OT	2	1.3%	1	1.0%	3	1.2%	
SLP	64	42.1%	20	20.8%	84	33.9%	
Teacher	30	19.7%	47	49%	77	31.0%	
Total	152	100%	96	100%	248	100%	26.023

Survey Question Six: Who is currently responsible to make sure the student uses the device?

As with other responsibilities, most SLPs, (81 or 53.3%) reported that making sure the student uses the device was their responsibility. Fifty-three SLPs (34.9%) reported that the teacher was responsible to make sure the student uses the device; two

SLPs (1.3%) noted that the ATC was currently responsible to make sure the student uses the device. Sixteen SLPs did not respond to this question.

Seventy-one teachers (74.0%) noted that making sure the student uses the device was currently their responsibility. Thirteen teachers (13.5%) reported that the SLP was responsible for making sure the student uses the device. One teacher (1.0%) reported that the ATC was responsible to make sure the student uses the device; one teacher (1.0%) reported that the OT was responsible to make sure the student uses the device. Ten teachers did not respond to this question.

A 44.127 Pearson chi-square value, with four degrees of freedom was obtained for this response set. A significance level of 0.0 α was obtained. The discipline of the participant (SLP or teacher) was related to response. Table 15 contains the results compared to discipline.

Table 15

Who is Currently Responsible to Make Sure the Student Uses the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	16	10.5%	10	10.4%	26	10.5%	
ATC	2	1.3%	1	1.0%	3	1.2%	
OT	0	0.0%	1	1.0%	1	0.4%	
SLP	81	53.3%	13	13.5%	94	37.9%	
Teacher	53	34.9%	71	74.0%	124	50.0%	
Total	152	100%	96	100%	248	100%	44.127

Survey Question Seven: Who is currently responsible to update and maintain the device?

Overall 80 SLPs (52.6%) reported updating and maintaining the device to be their responsibility. Forty-two SLPs (27.6%) noted that the ATC was responsible to update and maintain the device; 13 (8.6%) indicated that the teacher was responsible for this task. One SLP (0.7%) indicated that the OT was responsible to update and maintain the device. Nine SLPs did not respond to this question.

Thirty-seven teachers (38.5%) noted device maintenance and updating to be their responsibility. Twenty- five teachers (26.0%) reported that the ATC was currently responsible to update and maintain the device; another 25 teachers (26.0%) noted that the

SLP was responsible for the care of the device. Sixteen teachers did not respond to this question.

The final Survey Question pertaining to device maintenance and updating was noted by the majority of each professional to currently be their responsibility. The statistical analysis for this response set resulted in a Pearson chi-square value of 36.836 with four degrees of freedom. A significance level of 0.0 α was obtained. The discipline of the participant was related to the response to a high degree. Results are provided in Table 16.

Table 16

Who is Currently Responsible to Update and Maintain the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	16	10.5%	9	9.4%	25	10.1%	
ATC	42	27.6%	25	26.0%	67	27.0%	
OT	1	0.7%	0	0.0%	1	0.4%	
SLP	80	52.6%	25	26.0%	105	42.3%	
Teacher	13	8.6%	37	38.5%	50	20.2%	
Total	152	100%	96	100%	248	100%	36.836

Is there a Difference in the Views of SLPs and the Views of Teachers regarding who Should be Responsible for AAC Support in the Classroom?

This section addressed the support research question: Is there a difference in the views of SLPs and the views of teachers regarding who should be responsible for AAC support in the classroom? The seven survey questions were rewritten to focus on perceptions of responsibility of the participants, rather than current responsibilities. The manner in which the participants responded was indicative of who each person thinks should be responsible, or their perception of responsibility, for each task. Pearson chi Square tests were conducted to compare the responses given by teachers to those responses given by SLPs.

Other than obtaining device funding and making actual device selection, both teachers and SLPs indicated a preference for implementing AAC support tasks themselves. Making sure the device was ready for use and updating/maintaining the device was reported across three disciplines (ATC, SLP and teacher) as having responsibility. Ultimate responsibility to make sure the student used the device was considered to be the responsibility of the teacher. Detailed analysis for each question is provided below.

Survey Question Eight: Who should be responsible to decide which device is appropriate for the student?

Seventy-four SLPs (48.7%) considered the ATC as the professional who should assume primary responsibility for deciding on the specific device. Fifty-one SLPs

(33.6%) believed that they should be responsible for selecting the device; nine SLPs (5.9%) considered that the teacher should be responsible for making that decision. Eighteen SLPs did not respond to this question.

Thirty-four teachers (35.4%) believe that the ATC should be responsible for device selection. Twenty-eight teachers (29.2%) thought that they should be responsible for device selection; 21 teachers (21.9%) indicated that the SLP should be responsible for device selection. Thirteen teachers did not respond to this question.

A Pearson chi-square value of 26.589 with three degrees of freedom was obtained for the results. A significance level of 0.0 α was obtained, indicating the results were significant ($p < 0.5$). Both teachers and SLPs indicated that the ATC should be responsible for deciding which device is most appropriate for the student. Table 17 contains the results to this survey question.

Table 17

Who Should be Responsible to Decide Which Device is Appropriate for the Student?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	18	11.8%	13	13.5%	31	12.5%	
ATC	74	48.7%	34	35.4%	108	43.5%	
SLP	51	33.6%	21	21.9%	72	29.0%	
Teacher	9	5.9%	28	29.2%	37	14.9%	
Total	152	100%	96	100%	248	100%	26.589

Survey Question Nine: Who should be responsible to seek funding for the device?

A total of 115 SLPs (75.5%) believed that the ATC should be responsible to seek device funding. Fifteen SLPs (9.9%) noted that they should be responsible for seeking funding; 3 SLPs (2.0%) thought the teacher should be responsible for obtaining funding. One SLP (0.7%) reported that the OT should be responsible to seek funding. Eighteen SLPs did not respond to this question.

Sixty-four teachers (66.7%) considered that the ATC should be responsible for obtaining funding. Sixteen teachers (16.7%) reported that the SLP should obtain funding; three teachers (3.1%) indicated that teachers should seek funding. Thirteen teachers did not respond to this question.

Pearson chi-square value of 3.924 with four degrees of freedom was calculated. A significance level of 0.416 α was obtained, indicating the results were significant ($p < 0.5$). Discipline was not related to response for this question. Both teachers and SLPs indicated that the ATC should be responsible for obtaining funding. Results are provided in Table 18.

Table 18

Who Should be Responsible to Seek Funding for the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	18	11.8%	13	13.5%	31	12.5%	
ATC	115	75.7%	64	66.7%	179	72.2%	
OT	1	0.7%	0	0.0%	1	0.4%	
SLP	15	9.9%	16	16.7%	31	12.5%	
Teacher	3	2.0%	3	3.1%	6	2.4%	
Total	152	100%	96	100%	248	100%	3.924

Survey Question Ten: Who should decide on device vocabulary?

In regards to vocabulary selection 67 SLPs (44.1%) believed that vocabulary selection should be their responsibility. Sixty SLPs (39.5%) noted that the teacher should be responsible for vocabulary selection; six SLPs (3.9%) reported that the ATC should be responsible for vocabulary selection. Nineteen SLPs did not respond to this question.

Fifty-five teachers (57.3%) considered themselves as the professionals that should be responsible for vocabulary selection. Twenty-one teachers (21.9%) indicated that the SLP should be responsible for vocabulary selection; six teachers (6.3%) noted that the ATC should be responsible for vocabulary selection. Fourteen teachers did not respond to this question.

Pearson chi-square value of 13.040 with three degrees of freedom indicated that there is not a strong relationship between discipline and response. A significance level of 0.0 α was obtained, indicating the results were significant ($p < 0.5$). Each professional group indicated that this role should be the responsibility of their profession. It may be possible that teachers feel strongly about selecting vocabulary in that it directly relates to in classroom usage and the students' ability to participate in classroom instruction. The SLPs however, may feel that they should be responsible for vocabulary selection in that the device should be used not only for classroom instruction, but also for daily interactions and conversations. Addressing issues relating to social interactions and conversation are part of SLP training. Results are provided in Table 19.

Table 19

Who Should be Responsible to Decide on Vocabulary for the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	19	12.5%	14	14.6%	33	13.3%	
ATC	6	3.9%	6	6.3%	12	4.8%	
SLP	67	44.1%	21	21.9%	88	35.5%	
Teacher	60	39.5%	55	57.3%	115	46.4%	
Total	152	100%	96	100%	248	100%	13.040

Survey Question 11: Who should be responsible to create overlays/symbols for the device?

Sixty-three SLPs (41.4%) believed that overlay/symbol creation should be their responsibility. Another 45 SLPs (26.9%) noted that the teacher should be responsible to create overlays/symbols for the device; 27 SLPs (17.8%) considered that the ATC should be responsible for creating overlays/symbols for the device. One SLP (0.7%) reported that the OT should be responsible to create overlays/symbols; one SLP (0.7%) indicated that the PT should be responsible to create overlays/symbols. Sixteen SLPs did not respond to this question.

Forty-six teachers (47.9%) believed that they should be responsible for overlay/symbol creation. Twenty-four teachers (25.0%) indicated that the SLP should be responsible for overlay/symbol creation; 13 teachers (13.5%) thought the ATC should be responsible for overlay/symbol creation. Thirteen teachers did not respond to this question.

Pearson chi-square value of 11.653 with four degrees of freedom was obtained to this question. A significance level of 0.020 α was obtained, indicating the results were significant ($p < 0.5$). Responses were somewhat paired with discipline of the participant. Specifically, the results from each professional group indicated that each group reports overlay/symbol creation should be their responsibility. In addition, the second highest responses from each group (SLPs and teachers) indicated that the other group of professionals should be responsible (SLPS reported teachers and teachers indicated SLPs). Results are provided in Table 20.

Table 20

Who Should be Responsible to Create Overlays/Symbols for the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	16	10.5%	13	13.5%	29	11.7%	
ATC	27	17.8%	13	13.5%	40	16.1%	
OT	1	0.7%	0	0.0%	1	0.4%	
SLP	63	41.4%	24	25.0%	87	35.1%	
Teacher	45	29.6%	46	47.9%	91	36.7%	
Total	152	100%	96	100%	248	100%	11.653

Survey Question 12: Who should be responsible to make sure the device is ready for use?

Sixty-two SLPs (40.8%) believed that the teacher should be responsible to make sure the device is ready for use. Another 40 SLPs (26.3%) considered the ATC to be responsible for getting the device ready; 31 SLPs (20.4%) reported that SLPs should be responsible for making sure the device is ready for use. Two SLPs (1.3%) noted that the OT should be responsible to make sure the device is ready; two more SLPs (1.3%) reported that the PT should be responsible to make sure the device is ready for the student's use. Seventeen SLPs did not respond to this question.

Forty –one teachers (42.7%) reported that they should ensure the device was ready for the student. Twenty-four teachers (25.0%) noted that the ATC should make

sure the device is ready for the student; 17 teachers (17.7%) indicated that the SLP should make sure the device is ready for the student. Fourteen teachers did not respond to this question.

A Pearson chi-square value of 2.118 with four degrees of freedom was obtained for this question. A significance level of 0.714 α was obtained, indicating the results were not significant ($p > 0.5$). Response to this question was not related to discipline of the participant. Both groups of professionals believe that the teacher should be responsible for ensuring that the device is ready for use. Results are displayed in Table 21.

Table 21

Who Should be Responsible to Make Sure the Device is Ready for Use?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	17	11.2%	14	14.6%	31	12.5%	
ATC	40	26.3%	24	25.0%	64	25.8%	
OT	2	1.3%	0	0.0%	2	0.8%	
SLP	31	20.4%	17	17.7%	48	19.4%	
Teacher	62	40.8%	41	42.7%	103	41.5%	
Total	152	100%	96	100%	248	100%	2.118

Survey Question 13: Who should be responsible to make sure the student uses the device?

One hundred and seven SLPs (70.4%) noted that the teacher should be responsible for ensuring the student used the device. An additional 21 SLPs (13.8%) indicated that SLPs should be responsible to make sure the students uses the device; six SLPs (3.9%) reported that the ATC should be responsible to make sure the student uses the device. One SLP (0.7%) indicated that the OT should be responsible to make sure the student uses the device; one SLP (0.7%) indicated that the PT should be responsible to make sure the student uses the device. Seventeen SLPs did not respond to this question.

Seventy-one teachers (74.0%) believed that they should ensure the student used the device. Eight teachers (8.3%) noted that the SLP should be responsible to make sure the student uses the device; three teachers (3.1%) reported that the ATC should be responsible to make sure the student uses the device. Fourteen teachers did not respond to this question.

Pearson chi-square value of 2.902 with four degrees of freedom in regards to ensuring the student uses the device indicated that the discipline of the participant was not closely related to their response. A significance level of 0.574 α was obtained, indicating the results were not significant ($p > 0.5$). As with readying device for use, responses to this question were not related to discipline of the participant. Both groups of professionals believe that the teacher should be responsible to make sure the student uses the device. Table 22 contains results.

Table 22

Who Should be Responsible to Make Sure the Student Uses the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	17	11.2%	14	14.6%	31	12.5%	
ATC	6	3.9%	3	3.1%	9	3.6%	
OT	1	0.7%	0	0.0%	1	0.4%	
SLP	21	13.8%	8	8.3%	29	11.7%	
Teacher	107	70.4%	71	74.0%	178	71.8%	
Total	152	100%	96	100%	248	100%	2.902

Survey Question 14: Who should be responsible to update and maintain the device?

Fifty-five SLPs (36.2%) considered that the ATC should be responsible for device maintenance. Forty-six SLPs (30.3%) noted that SLPs should be responsible for device updating and maintenance; 32 SLPs (21.1%) reported that the teacher should be responsible for updating and maintaining the device. Two SLPs (1.3%) indicated the OT should be responsible to update and maintain the device; two SLPs (1.3%) indicated the PT should be responsible to update and maintain the device. Seventeen SLPs did not respond to this question.

Thirty-one teachers (32.3%) reported that the ATC should be responsible to update and maintain the device. Twenty-eight teachers (29.2%) noted that teachers should be responsible to update and maintain the device; 23 teachers (24.0%) reported

that the SLP should be responsible for device maintenance and updating. Fourteen teachers did not respond to this question.

Pearson chi-square value of 4.506 with four degrees of freedom was obtained for this question. A significance level of 0.342 α was obtained, indicating the results were significant ($p < 0.5$). The profession of the participant did not directly impact the response. Both groups indicated that the ATC should be responsible for updating and maintaining the device. Table 23 portrays the results for this survey questions.

Table 23

Who Should be Responsible to Update and Maintain the Device?

	Speech		Teacher		Total		chi square
profession	number	percent	number	percent	number	percent	
No response	17	11.2%	14	14.6%	31	12.5%	
ATC	55	36.2%	31	32.3%	86	34.7%	
OT	2	1.3%	0	0.0%	2	0.8%	
SLP	46	30.3%	23	24.0%	69	27.8%	
Teacher	32	21.1%	28	29.2%	60	24.2%	
Total	152	100%	96	100%	248	100%	4.506

Analysis of Views within Professions

The views of teachers and SLPs regarding AAC support in the classroom varied between the professions. However, there may also have been differences in the views of professionals within each profession as to who is currently responsible and who should

be responsible for each of the seven core tasks. A summary of the analysis of the responses within each profession will be provided in this section, along with a table containing the complete results. The analysis of the views of teachers will be followed by the analysis of the views of the SLPs.

Teachers

Who is currently responsible versus who should be responsible to decide which device is appropriate for the student?

Of the 96 teachers who responded to the survey, nine indicated that deciding which devices was appropriate for the student was currently their role and should be their role. This represented 9.3% of the teachers. Only six teachers (6.25%) who did not feel that they should be performing this task were performing this task. The majority of teachers (23 or 23.9%) indicated that the ATC was currently responsible and should be responsible for deciding which device was appropriate for the student. The chi square value for this finding was 89.101, with 12 degrees of freedom. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are in Table 24.

Table 24

Teacher Responses: Who is Currently Responsible versus Who Should be Responsible to Decide Which Device is Appropriate for the Student?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	8	8.3	0	0.0	1	1.0	0	0.0	9	9.3	
ATC	2	2.0	23	23.9	2	2.0	12	12.5	39	40.6	
SLP	2	2.0	5	5.2	17	17.7	7	7.2	31	32.3	
Teacher	0	0.0	5	5.2	1	1.0	9	9.3	15	15.6	
Total	13	13.5	34	35.4	21	21.8	28	29.1	96	100	89.101

Who is currently responsible versus who should be responsible to seek funding for the device?

Two teachers (2.0%) indicated that seeking funding for the device was currently their role and should be their role. Only three teachers (3.1%) indicated that they were performing this task even though they believed it was someone else's responsibility. Overall, most teachers (50 or 52.15%) reported that the ATC was currently and should be responsible for completing this task. A chi square value of 111.665, with 9 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Table 25 contains complete results.

Table 25

Who is Currently Responsible versus Who Should be Responsible to Seek Funding for the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	8	8.3	3	3.1	0	0.0	0	0.0	11	11.4	
ATC	3	3.1	50	52.1	0	0.0	1	1.0	54	56.2	
SLP	2	2.0	8	8.3	16	16.7	0	0.0	26	27.1	
Teacher	0	0.0	3	3.1	0	0.0	2	2.0	5	5.2	
Total	13	13.5	64	66.7	16	16.7	3	3.1	96	100	111.665

Who is currently responsible versus who should be responsible to decide on device vocabulary?

A total of 44 teachers responded that deciding on device vocabulary was currently their role and should be their role. This represented 45.8% of teachers. Seven (7.29%) teachers reported currently completing this task even though they believed someone else should be responsible. A chi square value of 112.384 with 9 degrees of freedom was obtained. A significance of 0.00 α indicated that that current roles and perceived roles were related. Table 26 contains full results.

Table 26

Who is Currently Responsible versus Who Should be Responsible to Decide on Device Vocabulary?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	9	9.3	0	0.0	1	1.0	0	0.0	10	10.4	
ATC	0	0.0	5	5.2	3	3.1	2	2.0	10	10.4	
SLP	3	3.1	0	0.0	13	13.5	9	9.3	25	26.0	
Teacher	2	2.0	1	1.0	4	4.2	44	45.8	51	53.1	
Total	14	14.5	6	6.25	21	21.8	55	57.3	96	100	112.384

Who is currently responsible versus who should be responsible to create overlays/symbols for the device?

Thirty-five teachers (36.5%) indicated that creating overlays/symbols for the device was currently their role and should be their role. Eleven teachers (11.4%) noted that they were completing this task but that they believed someone else should be completing the task. A chi square value of 88.836, with 9 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are in Table 27.

Table 27

Who is Currently Responsible versus Who Should be Responsible to Create Overlays/Symbols for the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	9	9.3	0	0.0	1	1.0	1	1.0	11	11.4	
ATC	1	1.0	7	7.3	5	5.2	1	1.0	14	14.5	
SLP	1	1.0	2	2.0	13	13.5	9	9.3	25	26.0	
Teacher	2	2.0	4	4.2	5	5.2	35	36.4	46	47.9	
Total	13	13.5	13	13.5	24	25	46	47.9	96	100	88.836

Who is currently responsible versus who should be responsible to make sure the device is ready for use?

A total of 31 teachers responded that making sure the device was ready for use was currently their role and should be their role. This represented 32.3% of teachers. Sixteen teachers (16.7%) reported completing this task even though they believed someone else should be responsible. A chi square value of 95.262 with 12 degrees of freedom was obtained. A significance of 0.00 α indicated that that current roles and perceived roles were related. Table 28 contains complete results.

Table 28

Who is Currently Responsible versus Who Should be Responsible to Make Sure the Device is Ready for Use?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	9	9.3	1	1.0	0	0.0	1	1.0	11	11.4	
ATC	2	2.0	10	10.4	1	1.0	4	4.2	17	17.7	
SLP	0	0.0	3	3.1	13	13.5	4	4.2	20	20.8	
Teacher	3	3.1	10	10.4	3	3.1	31	32.2	47	48.9	
Total	14	14.5	24	25	17	17.7	41	42.7	96	100	95.262

Who is currently responsible versus who should be responsible to make sure the student uses the device?

Sixty-three teachers (65.6%) indicated that responsibility to make sure the students used the device was currently their role and should be their role. Only eight (8.3%) teachers were completing this task when they noted that it should be someone else's role. A chi square value of 96.196, with 12 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are provided in Table 29.

Table 29

Who is Currently Responsible versus Who Should be Responsible to Make Sure the Student Uses the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	8	8.3	0	0.0	0	0.0	2	2.0	10	10.4	
ATC	0	0.0	1	1.0	0	0.0	0	0.0	1	1.0	
SLP	1	1.0	1	1.0	5	5.2	6	6.2	13	13.5	
Teacher	4	4.2	1	1.0	3	3.1	63	65.6	71	73.9	
Total	14	14.5	3	3.1	8	8.3	71	73.9	96	100	96.196

Who is currently responsible versus who should be responsible to update and maintain the device?

Twenty teachers (20.8%) indicated that updating and maintaining the device was currently their role and should be their role. Seventeen teachers (17.7%) indicated that someone else should be completing this task, but that they were completing the task. A chi square value of 97.733, with 9 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are provided in Table 30.

Table 30

Who is Currently Responsible versus Who Should be Responsible to Update and Maintain the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	8	8.3	1	1.0	0	0.0	0	0.0	9	9.3	
ATC	2	2.0	18	18.7	1	1.0	4	4.2	25	26.0	
SLP	2	2.0	2	2.0	17	17.7	4	4.2	25	26.0	
Teacher	2	2.0	10	10.4	5	5.2	20	20.8	37	38.5	
Total	14	14.5	31	32.2	23	23.9	28	29.1	96	100	97.733

Speech-Language Pathologists

Who is currently responsible versus who should be responsible to decide which device is appropriate for the student?

Of the 152 SLPs who responded to the survey, 28 indicated that deciding which devices was appropriate for the student was currently their role and should be their role. This represented 18.4% of the SLPs. Fourteen (9.21%) SLPs indicated that they were completing this task when they felt someone else should be completing the task. The majority of SLPs (59 or 38.8%) noted that the ATC was currently responsible and should be completing this task. The chi square value for this finding was 102.964, with 9 degrees of freedom. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are provided in Table 31.

Table 31

Who is Currently Responsible versus Who Should be Responsible to Decide Which Device is Appropriate for the Student?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	12	7.89	1	0.6	1	0.6	1	0.6	15	9.8	
ATC	4	2.63	59	38.8	21	13.8	8	5.2	92	60.5	
SLP	2	1.3	12	7.89	28	18.4	0	0.0	42	27.6	
Teacher	0	0.0	2	1.3	1	0.6	0	0.0	3	1.9	
Total	18	11.8	74	48.6	51	33.5	9	5.9	152	100	102.964

Who is currently responsible versus who should be responsible to seek funding for the device?

Twelve SLPs (7.9%) indicated that seeking funding for the device was currently their role and should be their role. Fourteen SLPs (9.21%) reported completing this task even though they believed someone else should be responsible. The majority of SLPs (97 or 63.8%) noted that the ATC was currently completing and should be responsible for this task. A chi square value of 119.889, with 12 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Table 32 contains complete results.

Table 32

Who is Currently Responsible versus Who Should be Responsible to Seek Funding for the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	13	8.5	4	2.63	1	0.6	1	0.6	19	12.5	
ATC	5	3.2	97	63.8	2	1.3	1	0.6	105	69.0	
SLP	0	0.0	13	8.5	12	7.8	1	0.6	27	17.7	
Teacher	0	0.0	1	0.6	0	0.0	0	0.0	1	0.6	
Total	18	11.8	115	75.6	15	9.8	3	1.9	152	100	119.889

Who is currently responsible versus who should be responsible to decide on device vocabulary?

A total of 53 SLPs responded that deciding on device vocabulary was currently their role and should be their role. This represented 34.8% of SLPs. However, 40 SLPs (26.3%) reported they were completing this task but that someone else should be completing the task. Thirty-one of these SLPs indicated that the teacher should be deciding on device vocabulary, but that the SLP was making these decisions. This indicated that a total of 20.3% of SLPs were completing a task they believed was the teachers' responsibility. A chi square value of 89.844 with 9 degrees of freedom was obtained. A significance of 0.00 α indicated that that current roles and perceived roles were related. Table 33 contains complete results.

Table 33

Who is Currently Responsible versus Who Should be Responsible to Decide on Device Vocabulary?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	11	7.2	0	0.0	1	0.6	2	1.3	14	9.2	
ATC	1	0.6	3	1.9	9	5.9	6	3.9	19	12.5	
SLP	6	3.9	3	1.9	53	34.8	31	20.3	93	61.2	
Teacher	1	0.6	0	0.0	4	2.63	21	13.8	26	17.1	
Total	19	12.5	6	3.9	67	44.1	60	39.4	152	100	89.844

Who is currently responsible versus who should be responsible to create overlays/symbols for the device?

Forty-nine SLPs (32.2%) indicated that creating overlays/symbols for the device was currently their role and should be their role. However, 44 SLPs (28.9%) reported that they were completing the task when they believed that someone else should be completing the task. Of these 44 SLPs, 31 reported that they thought the teacher should be responsible for creating overlays/symbols for the device. This indicated that a total of 20.3% of SLPs were completing a task they believed was the teachers' responsibility. A chi square value of 98.379, with 16 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are provided in Table 34.

Table 34

Who is Currently Responsible versus Who Should be Responsible to Create Overlays/Symbols for the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	11	7.2	2	1.3	2	1.3	1	0.6	16	10.5	
ATC	2	1.3	13	8.5	7	4.6	3	1.9	25	16.4	
SLP	2	1.3	11	7.2	49	32.2	31	20.3	95	62.5	
Teacher	1	0.6	1	0.6	4	2.63	9	5.9	15	9.8	
Total	16	10.5	27	17.7	63	41.4	45	29.6	152	100	98.379

Who is currently responsible versus who should be responsible to make sure the device is ready for use?

A total of 25 SLPs responded that making sure the device was ready for use was currently their role and should be their role. This represented 16.4% of SLPs. Thirty-nine SLPs (25.6%) reported that they were completing this activity even though they noted that someone else should be completing this task. The majority of SLPs (31 or 20.3%) indicated that the ATC was currently responsible and should be responsible for making sure the device was ready for use. A chi square value of 193.181 with 16 degrees of freedom was obtained. A significance of 0.00 α indicated that that current roles and perceived roles were related. Table 35 contains complete results.

Table 35

Who is Currently Responsible versus Who Should be Responsible to Make Sure the Device is Ready for Use?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	11	7.2	1	0.6	1	0.6	3	1.9	16	10.5	
ATC	1	0.6	31	20.3	3	1.9	4	2.6	40	26.3	
SLP	2	1.3	7	4.6	25	16.4	30	19.7	64	42.1	
Teacher	3	1.9	0	0.0	2	1.3	25	16.4	30	19.7	
Total	17	11.1	40	26.3	31	20.3	62	40.7	152	100	193.181

Who is currently responsible versus who should be responsible to make sure the student uses the device?

Nineteen SLPs (12.5%) indicated that responsibility to make sure the students used the device was currently their role and should be their role. Twenty-five SLPs (16.4%) noted they were completing this task but that they believed someone else should be completing the task. Overall, 47 SLPs (30.9%) reported that the teacher was currently responsible and should be responsible to make sure the student used the device. A chi square value of 135.535, with 12 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are provided in Table 36.

Table 36

Who is Currently Responsible versus Who Should be Responsible to Make Sure the Student Uses the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%		%	
NR	12	7.8	0	0.0	0	0.0	4	2.6	16	10.5	
ATC	0	0.0	2	1.3	0	0.0	0	0.0	2	1.3	
SLP	4	2.6	2	1.3	19	12.5	56	36.8	81	53.2	
Teacher	1	0.6	2	1.3	2	1.3	47	30.9	53	34.8	
Total	17	11.1	6	3.9	21	13.8	107	70.3	152	100	135.535

Who is currently responsible versus who should be responsible to update and maintain the device?

Forty SLPs (26.3%) indicated that updating and maintaining the device was currently their role and should be their role. However, 40 SLPs (26.3%) noted that they were currently completing this task but believed that someone else should be responsible. A chi square value of 188.116, with 16 degrees of freedom was determined. The significance level was 0.00 α, indicating that current roles and perceived roles were related. Complete results are provided in Table 37.

Table 37

Who is Currently Responsible versus Who Should be Responsible to Update and Maintain the Device?

Should	NR		ATC		SLP		Teacher		Total		chi Square
Current	No	%	No	%	No	%	No	%	No	%	
NR	11	7.2	4	2.6	0	0.0	1	0.6	16	10.5	
ATC	0	0.0	29	19.0	6	3.9	7	4.6	42	27.6	
SLP	4	2.6	20	13.1	40	26.3	16	10.5	80	52.6	
Teacher	2	1.3	2	1.3	0	0.0	8	5.2	13	8.5	
Total	17	11.1	55	36.1	46	30.2	32	21.0	152	100	188.116

Summary

Analysis testing of the responses within professions indicated that current roles and perceived roles were related for both teachers and SLPs. This may have been in part due to state, county or school policy. Specifically, if stated policy was that teachers perform certain roles, the teachers may have reported their agreement with the stated policy. In addition, teachers and SLPs may have noted changing views and roles within their fields based on changing laws, professional policies and needs of students. Overall, teachers generally indicated that they were providing support tasks within their current and perceived scopes of practice. However, for two questions (Who is currently responsible to decide on device vocabulary and Who is currently responsible to create overlays/symbols for the device) 20.3% of SLPs indicated that they were currently responsible for completing tasks they believed were the responsibility of the teacher.

Summary of Statistical Analysis and Hypothesis

Of the research questions considered, only one was appropriate for hypothesis testing: Is there a difference in the views of SLPs and the views of teachers regarding who should be responsible for AAC support in the classroom? It was hypothesized that each professional (SLP or teacher) perceived many aspects of AAC implementation and support to be the responsibility of the other professional. More precisely, the null hypothesis (H_o) was: There is no difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom. The alternative hypothesis (H_1) was: There is a difference in the views of SLPs and teachers regarding who is responsible for AAC support in the classroom.

In order to fully examine the hypothesis, a chi square test was conducted for each of the seven survey questions regarding perceived responsibilities of AAC support in the classroom. Each question and test results are summarized individually.

Who do you think should be primarily responsible to decide which device is appropriate for the student? The results of the chi square test yielded a value of 26.589, with three degrees of freedom. A significance level of 0.0 α was obtained, indicating that the results were significant ($p < 0.5$). The null hypothesis was accepted for this question; both professions indicated the ATC should be primarily responsible.

Who do you think should be primarily responsible to seek funding for the device? Pearson chi-square value of 3.924 with four degrees of freedom was calculated. A significance level of 0.416 α was obtained, indicating the results were significant

($p < 0.5$). The null hypothesis was accepted for this question; both professionals indicated the ATC should be primarily responsible.

Who do you think should be primarily responsible to decide on device vocabulary? Pearson chi-square value of 13.040 with three degrees of freedom indicated that there is not a strong relationship between discipline and response. A significance level of 0.0 α was obtained, indicating the results were significant ($p < 0.5$). The null hypothesis was rejected for this question; each set of professionals indicated they should have primary responsibility for this task.

Who do you think should be primarily responsible to create overlays/symbols for the device? Pearson chi-square value of 11.653 with four degrees of freedom was obtained to this question. A significance level of 0.020 α was obtained, indicating the results were significant ($p < 0.5$). The null hypothesis was rejected; each group of professionals reported that they should have primary responsibility for creating overlays/symbols.

Who do you think should be primarily responsible to make sure device is ready for use? A Pearson chi-square value of 2.118 with four degrees of freedom was obtained for this question. A significance level of 0.714 α was obtained, indicating the results were not significant ($p > 0.5$). The null hypothesis was accepted; both professional groups indicated that the teacher should have primary responsibility for ensuring device readiness.

Who do you think should be primarily responsible to make sure student uses the device? Pearson chi-square value of 2.902 with four degrees of freedom in regards to

ensuring the student uses the device indicated that the discipline of the participant was not closely related to their response. A significance level of 0.574 α was obtained, indicating the results were not significant ($p > 0.5$). The null hypothesis was accepted; both groups of professionals noted that the teacher should have primary responsibility in making sure the student used the device.

Who do you think should be primarily responsible to update and maintain the device? Pearson chi-square value of 4.506 with four degrees of freedom was obtained for this question. A significance level of 0.342 α was obtained, indicating the results were significant ($p < 0.5$). The null hypothesis was accepted; both groups noted that the ATC should have primary responsibility for updating and maintaining the device.

Overall, the null hypothesis was rejected for two of the seven questions: who should be responsible for vocabulary selection and who should be responsible to create overlays/symbols. The null hypothesis was accepted for the remaining five questions.

Professional Staff Availability

It was important to determine the frequency and availability of support staff in order to consider the impact of staffing on AAC support and usage. Although the teacher may be absent on certain days for various reasons, it was assumed that the teacher is in school most every day. Therefore this question focused on the presence of support personnel in the participant's school. A high percentage of participants did not respond to this question (21.1% regarding ATC, 50% regarding OT, 49.5% regarding SLP and 50.4% regarding PT). This may have been in part due to limited response options (i.e.,

bi-weekly, bi-monthly, yearly were not provided as response options, but the professional may be in the school at these levels of frequency, therefore the participant left the answer blank). The frequency each professional is in the school is provided in Table 38.

Table 38

How often are Professionals in School?

Frequency	ATC	OT	SLP	PT
Daily	7	40	90	33
Weekly	10	69	31	60
Monthly	19	7	1	7
Quarterly	31	1	0	5
Don't know	127	6	2	17
No response	52	123	122	124

It is possible that teachers and SLPs believe that the ATC should be responsible for AAC support activities that require a higher level of presence in the school than the ATC currently provides. This may contribute to decreased AAC usage by students. Specifically, if the ATC should be responsible for updating and maintaining the device, but if they are only in the school quarterly, then a broken device may not be repaired for several months. In addition, if the ATC should be responsible for programming the device, but they are not in the school as frequently as lessons change, vocabulary for specific lessons may not be available to the student in a timely manner. The responses indicating that the participants do not know how often the ATC is in the school may result in unrealistic expectations being placed on the ATC.

Barriers and Supports

It has been noted that without clearly defined roles and responsibilities, teachers and SLPs may experience difficulty in supporting students who use AAC in the classroom. However, other factors may also impact school staff's ability to support students who use AAC and meet their various needs. These factors were considered as barriers and supports to device implementation. Overcoming barriers and increasing supports may be as effective in improving services to students who use AAC as defining support staff roles. Barriers to effective AAC implementation will be followed by supports to AAC implementation.

Gaps in training. Numerous barriers to AAC implementation were considered. The first set of barriers considered related to gaps in preservice training. It was noted that teachers and SLPs may be called upon to provide services in areas or topics in which they received limited training. AAC supports and implementation services were noted to be one of these areas. It should be noted that although participants were asked "Do you have enough training to implement and support device usage?" and if yes, skip to next question, some participants who responded "yes" reported gaps. Forty-five teachers and 86 SLPs reported that they did not have enough training to implement and support device usage. Gaps in training compared to profession are provided in Table 39.

Table 39

Gaps in Training:

	SLP		Teacher		Total	
Training Gap	Number	percent	Number	percent	Number	percent
Knowledge of available devices	39	45.3%	30	66.6%	69	52.6%
Knowledge of funding	25	29.0%	29	64.6%	54	41.2%
Techniques to incorporate the device into curriculum	22	25.6%	19	42.2%	41	31.3%
Strategies to incorporate the device into general classroom activities	22	25.6%	17	37.7%	39	29.8%
How to select vocabulary	10	11.6%	16	35.5%	26	19.8%
Development of appropriate overlays/symbols	17	19.7%	15	33.3%	32	24.2%
How to prepare/set-up the device for use in the classroom	27	31.3%	21	46.6%	48	36.6%
Device care and maintenance	26	30.2%	20	44.4%	46	35.1%

Both teachers and SLPs noted that they have a lack of knowledge of available AAC devices. This issue is exacerbated by the rate of development of new technology and resulting AAC devices. Even as the teacher or SLP became proficient and confident in supporting a particular system, new systems or upgraded models of existing systems become available. Yearly or possibly more frequent, training and knowledge update may be needed as new devices become available.

Although most teachers and SLPs indicated that the ATC should be responsible for obtaining funding for AAC devices, both groups noted lack knowledge of funding

sources. Knowledge of funding sources, as well as the services funded, may inhibit requests for AAC services by the teachers and SLPs. Many schools require some degree of fiscal responsibility and may not be able to afford devices, even when mandated on a student's IEP. While this is not an acceptable reason to deny or delay services, financial concerns must be taken into consideration. Knowledge of funding sources outside of the student's school, such as lending libraries, private insurance, civic organizations and equipment recycling, may increase teacher and SLP confidence in requesting devices and services.

Two areas of device implementation were included in this section. Knowledge of techniques to incorporate the device into the curriculum was reported as a training gap by 25 SLPs and 19 teachers. Lack of knowledge of strategies to incorporate the device into general classroom activities was reported by 22 SLPs and 17 teachers. These two areas are key to in school device usage. The ability to use the device to demonstrate learning (device incorporated into the curriculum) and interact with staff and peers (incorporate into general classroom activities) may be viewed as two of the primary reasons for using an AAC device within a school setting. The ability to incorporate the device as a functional means of communication may be the most important reason for device usage for each student. Functional AAC usage may be the ultimate communicative or educational outcome for many students. Other than obtaining the device, these areas are most reflective of student driven needs, rather than teacher or SLP driven needs.

Vocabulary selection and development of symbols/devices were least often noted as a preservice training gap. Ten SLPs and 16 teachers noted vocabulary selection as

impeding device support and implementation. This may be in part due to the availability of various vocabulary lists specific to grade level, curriculum topic/lesson or lists developed by adults who use AAC. Additionally, 17 SLPs and 15 teachers reported symbol/overlay development as a training gap. The use of Mayer Johnson Picture Communication Symbols as the standard in speech-language pathology, in addition to the prevalence of premade overlays and preprogrammed AAC devices may, to some degree, decrease the need for training in this area.

The ability to prepare and/or set-up the device for use in the classroom was identified by 27 SLPs and 21 teachers as a gap in their training. This task is related to actual student hands-on usage of the AAC device. Similar to incorporating the device into the curriculum and general classroom activities, set-up of the device for daily usage directly impacts the student's ability to use the device to demonstrate learning or engage in social interactions. Teachers need to knowledgeable about table top, wheelchair and free standing mounting systems in order to ensure the device is secured in the classroom. In addition, the teacher must know how the student accesses the system (e.g., touching a symbol, accessing a switch, etc.); having the ability to access the device as previously determined directly impacts the student's ability to use the system.

The last task considered was device care and maintenance. Both SLPs and teachers had noted that this should be the responsibility of the ATC. However, the SLP or teacher is more likely to be available when updating or maintenance is required. Twenty-seven SLPs and 21 teachers considered knowledge of device updating and maintenance to be a gap in their training. Some aspects of this task are specific to each

AAC device (e.g., Prentke-Romich products versus DynaVox Systems versus a communication board); other aspects are more consistent across systems (e.g., the need for charging the device battery). The ability to perform basic trouble shooting may also be required on a more frequent basis than the ATC could address.

All responses given in the section "(If no, for question 23), Where are the gaps in your training? Check all that apply" are included in Table 39. Percentages are noted based on participants per group who responded to the question, not the total number of participants per group.

Barriers to device implementation. When asked "Is there anything that prevents from doing what you think you are responsible to do? Check all that apply," 23 teachers and 28 responded no. The remaining 197 participants indicated one or more of the four barriers noted as preventing them from completing their responsibilities. Time was by far the greatest barrier, with 172 of 197 participants reporting this as a barrier. Knowledge was reported by 86 participants as a barrier. Money was a concern for 86 participants; however, precisely how money was a barrier was not addressed. Lastly, administrative support was reported as a barrier by 62 of 197 participants. Table 40 details which profession reported on each indicator.

Table 40

Barriers

	SLP		Teacher		Total	
Barrier	number	percent	number	percent	number	percent
Time	109	87.9%	63	86.3%	172	87.3%
Money	47	37.9%	34	46.6%	81	41.1%
Knowledge	56	45.1%	30	41.1%	86	43.6%
Administrative support	43	36.7%	19	26.0%	62	31.5%

Conclusion

There were some distinct response patterns to several of the questions posed in this survey. It was clear that both teachers and SLPs believe that the ATC should be responsible to seek funding for devices and to update and maintain the devices. It was also evident that both teachers and SLPs believe that the teacher should have primary responsibility to make the device is ready for use and that the student uses the device. These responses may reflect traditional roles of each profession, as well as a logical division of labor. The ATC may have ongoing relationships with vendors, manufacturers and funding sources, making them the logical choice for assuming the role of actually securing the device. If the teacher is in the classroom every day, it makes sense that they would assume primary responsibility for preparing the device and ensuring the student uses the device.

However, for the three remaining questions response patterns in other areas were more disparate. The responses regarding which professional should be primarily responsible for device selection were spread across disciplines. No one professional was overwhelmingly noted by teachers as being the one who should be most responsible for

device selection. Rather, the teachers reported ATCs, teachers and then SLPs as those who should be responsible for device selection. Teachers may have indicated ATC in that some of the teachers noted knowledge of specific devices as a gap in their training. Other teachers may have greater knowledge of the various devices or may feel comfortable using devices from one specific company, leading them to select those devices and a desire to hold responsibility for device selection. Conversely, SLPs noted that either the ATC or members of their profession should be responsible for device selection. This may have reflected the changing roles of SLPs in the classroom or a belief that most aspects of communication belong under the auspices of SLPs.

The remaining two questions had somewhat mixed responses. These questions were: who should be responsible to decide on device vocabulary and who should be responsible to create overlays/symbols for the devices. Although the majority of responses from each group of professionals noted these two responsible as falling under their professional domain, the next most frequent response level noted the other professionals to be responsible for these tasks. These responses were the only ones to offer any degree of support for the hypotheses that each professional (SLP or teacher) perceives many aspects of AAC implementation and support to be the responsibility of the other professional.

Chapter 5: Discussion

Overview of the Study

The purpose of this study was to define the roles of teachers and SLPs regarding AAC services. Various supportive tasks were considered within the context of the survey. The key research question was: Who is responsible for implementing and supporting AAC in the classroom? Related questions considered the current and perceived/suggested roles of teachers and SLPs for classroom-based AAC support and differences in the views of teachers and SLPs regarding who is responsible for AAC support in the classroom. An Internet-based survey, consisting of 21 categorical based questions, was sent to teachers and SLPs who were members of a technology advocacy and support center located in a Mid Atlantic state. A total of 262 of 774 eligible professionals responded to the survey (96 teachers and 152 SLPs; 30% response rate was achieved). Responses collected through the survey site were analyzed using a chi squared test.

Survey Questions

The two sets of core questions focused on tasks that support AAC usage in the classroom. The first set addressed who, of five professionals (Teacher, SLP, ATC, OT and PT) was currently responsible for seven specific AAC support tasks.

The second set of core questions addressed the participants' opinion as to who should be responsible for each of the seven tasks identified. A majority of both teachers

and SLPs indicated that the ATC should be responsible to obtain funding for AAC devices and for updating and maintaining the devices once received. Teachers and SLPs agreed that the teacher should assume primary responsibility for ensuring device readiness and ensuring student use of the device. If teachers and SLPs agree that the classroom teacher should be responsible for ensuring device readiness and that the student uses the device, then the student's degree of dependency upon the teacher's knowledge and familiarity with the AAC system will increase. The teachers must have sufficient training in order to meet the students' needs.

Interpretations of the Findings

Theoretical Framework and Past Studies

The theoretical framework for this study was based on Dewey's (1927, 2000) philosophies regarding communities. Dewey noted that in order for a community to work, each member must contribute. However, communities also need to function as a unit and in order to do so, each community needs a clearly identified leader or leaders. Leadership may change based on the task at hand. Each member may assume a leadership role when his or her expertise is required; at other times, this same member may take on a lesser, but still important, role.

Additional aspects were based on the findings of the 1990 Locke and Mirenda study. Locke and Mirenda's findings indicated that a team approach is most appropriate when providing AAC support services to students. While AAC teams may vary in their make-up, they generally include the teacher and SLP. As more people conducted

research, assistive technology specialists or coordinators (ATCs) were added to the team. However, team leadership was not consistently established by the various teams, nor were the roles and responsibilities of each team member defined. Without leadership, teams were likely to falter; without clearly defined roles and responsibilities, team members' duties and accountabilities were ambiguous. If all support tasks are not provided to students, student needs will not be met. When student needs are not met, students do not achieve their potential.

Past and Present Findings

The division of labor for the seven core tasks indentified may need to be based not only on preservice training, but also on more practical aspects such as amount of time spent with the student and amount of time spent in the school. For example, teachers are presumably with the student on a daily basis, making them the most logical person to ensure the device is ready for use and that the student uses the device. The ATC may have the most up to date information regarding current devices and funding sources, making him or her the logical leader for device selection, seeking funding and updating and maintaining the device. However, because teachers and SLPs have specific information about the student, their opinions should count heavily towards final device selection.

Vocabulary selection and creation of overlays/symbols may need to be split between the SLP and the teacher in that each professional brings a different perspective to this task: SLPs may be more concerned with vocabulary necessary for daily, functional

communication, while the teacher may be more concerned with academic-based vocabulary. The responses collected in this survey indicated that SLPs and teachers both assumed responsibility for these two tasks; however, 20.3% of SLPs indicated that they believed teachers should be responsible for this task. These responses may be indicative of the need for SLPs and teachers to collaborate on these two tasks. Detailed analysis of past and present findings for each of the seven core tasks follows this section.

Obtaining Device Funding

Locke and Mirenda (1990) noted that while 23% of teachers reported funding acquisition as being their responsibility, they also ranked acquiring funds as a role they "preferred not to assume." Teacher participants in both Locke and Mirenda (1990) and the current study reported that this support task should be the responsibility of someone else. SLPs agreed that seeking funding should generally not be the teacher's responsibility. Lack of knowledge of funding sources and time constraints may have impacted the teachers' views as to their role in seeking funding. Obtaining financial resources has not been a traditional area of educational training for teachers. However, without funding, students will not receive needed communication devices.

Vocabulary Selection and Creation of Overlays/symbols

In the current study, teachers and SLPs both indicated that their profession should have responsibility for vocabulary selection and creation of overlays/symbols. However, they also indicated that if they were not responsible, then the other profession should be responsible. These opinions may be reflective of preservice training in which both

professionals learn to address student vocabulary development. Creation of symbols/overlays directly relates to language and grammar development and usage. These are areas of overlap seen in the training of both sets of professionals. Each would feel a sense of responsibility towards providing support in this area; however, their knowledge of the skills of the other professional may increase their belief that someone else could be responsible for addressing vocabulary and language related support tasks. In that both professionals feel a sense of responsibility, students should consistently have access to needed vocabulary and representative symbols/overlays. Yet, without cooperation and coordination between the teachers and SLPs, each may believe that the other has completed this task. Teachers may be addressing academic-based vocabulary, whereas SLPs may be addressing functional communication skills. Conversely, the teachers and SLPs may be duplicating work, possibly giving the student conflicting information. This conflict may negatively impact the student's interest and ability to use the system as a fluent means of communication.

Preparing the Device for Student Usage

There was a strong level of agreement between teachers and SLPs as to the professional who should ensure that the device is ready for the student: teachers should be responsible. However, not all of the teachers indicated that readying the device was their responsibility. If these teachers do not ready the device, they may have been relying on support from a professional who was not in the school on a daily basis, specifically, the ATC. The perception that ATCs should ensure device readiness may be related to

comfort levels in using programming features of the AAC device, concerns about breaking or damaging devices and time constraints. For students whose teachers and SLPs believe that the ATC should be responsible for ensuring device readiness, there may be a lack of support in that the ATC is not in the school on a daily basis; therefore the student may be required to wait for their device to be made ready. This wait time could contribute to device abandonment or student frustration in not having access to their device when it is needed.

Ensuring the Student Uses the Device

One of the strongest areas of agreement concerned ensuring that the student used the device; 74% of teachers and 70% of SLPs indicated that the teacher should be responsible for ensuring the student used the device. In that the teacher is typically in the classroom on a daily basis and has the most ongoing interactions with the student, it is logical that both teachers and SLPs would agree that teachers should be responsible for these tasks. The students of the 26% of teachers who indicated that ensuring the student used the device may be at a great disadvantage. These students would be lacking basic continuous classroom support of their daily communication.

Device Selection

Responses to the remaining question on the current study, regarding device selection, were more varied. Both teachers and SLPs indicated various professionals as being most responsible for device selection. Responses may have been indicative of feelings of ownership of this task, lack of skills necessary to complete the task or a belief

that the skill sets of other professionals made them more adept at completing the tasks. Responses to questions pertaining to gaps in knowledge support the possibility that teachers and SLPs believe that others (e.g., ATC) should make device determination in that they may be more knowledgeable and therefore more qualified to make this decision. Yet without input from the two professionals who most frequently interact with the student (teachers and SLPs) poor decisions may be made during device selection. Teachers interact with the student on a daily basis and during a variety of activities. The ATC mostly likely interacts with the student during structured evaluative activities and only a few times. In the end, both the student and the teacher need to be comfortable using the device in order to increase AAC device usage.

Summary of Overall findings

Ultimately, teachers and SLPs held themselves responsible for specific tasks. When they gave responsibility to another professional, it was usually to their survey counterpart; SLPs considered teachers to be most responsible second to them, while teachers considered SLPs to be most responsible secondary to teachers. The only areas which did not conform to this generalization were obtaining device funding and updating the device; both teachers and SLPs agreed that the ATC should be responsible for these tasks.

Implications for Social Change

It appears that little has changed since the findings of the Locke and Mirenda (1990, 1992) studies were published. Assistive technology teams have formed, but

support tasks need to be completed in order for teachers and other team members to be able to effectively aid the student in AAC device usage. Clearly defined roles and division of labor of the seven core tasks would decrease the likelihood of gaps in AAC support to students. Identification of team leaders or division of labor of support tasks, may result in clearer understanding of roles. Once roles are defines, improved teacher and SLP training could be provided. This improved training would aid teachers and SLPs in incorporating AAC systems into the school day and after school activities. Increased practice with AAC devices has been demonstrated to increase effective AAC usage (Sigafoos, 1995; Sevcik, et al., 1999; Johnston, et al., 2003). Change across the college and university settings would be required in order to effect the positive social change of enhanced AAC support for students and the potential for increased functional communication using the AAC device.

Positive social change for individuals who use AAC for communication would be seen in an increased use of the device not only to demonstrate learning, but also in increased opportunities for peer socialization. Furthermore, potential benefits to families and caregivers would be obtained in that greater communicative opportunities with the family member who used AAC would be possible, including the ability to discuss thoughts, needs, ideas and other conversational exchanges. Additional social change may be observed as an increase in the pursuit of higher education and increased employment opportunities for individuals for use AAC.

Benefits to the community could be seen in the accompanying decrease in unemployment rates of people who use AAC and an increase in financial contribution to

the community. Individuals who are employed are better able and more likely to spend disposable income in their own community. The overall implications for social change may be somewhat limited to a single family or community, but for the individual who uses AAC, the positive social change of increased independence and interactions may be substantial.

Recommendations for Action

Further research on a larger scale should be conducted in order to determine if the results of this study are specific only to the targeted Mid Atlantic state or if similar findings would be found in other states. Determining reasons for discrepancy between who should be completing each task and who is currently completing the task should also be investigated.

Clearly defined roles for teachers and SLPs who work with students who use AAC should be established. In that there are various tasks required in order to adequately support students who use AAC, a team leader for each of these tasks should be identified. The leader may vary from task to task in order to most effectively meet the needs of the student within the skill set and time constraints of the educational staff.

Role definition should be established by the student's school system, with support coming from colleges, universities and professional organizations. These entities need to work together in order to establish roles that are realistic and can be maintained by the educational staff. Input from local education agencies is necessary in order to create realistic roles based on time spent with the student, staffing and time spent in the school.

Preservice education agencies need to be included in order to ensure that teaching is offered in the areas determined to be the responsibility of the teacher and SLP. Areas in which professions share responsibility should be included in preservice training for each group of professionals. When possible, it may be beneficial for these future educators and therapists to receive this training together.

Recommendations for Further Study

Several questions pertaining to AAC use in the classroom and the roles of teachers and SLPs became evident during the course of this study. Reimer-Reiss (2000) reported there is limited research into the reasons for AAC device abandonment and Philips and Zhoa (1993, as reported by Hutchins, et al., 2005) reported that one third of assistive technology devices, including AAC devices are abandoned. If teachers and SLPs are aware of their roles and responsibilities and they are providing appropriate supports, then why are devices abandoned? Determining reasons for device abandonment and eliminating these issues will aide in increased social and academic opportunities for individuals who rely on AAC for communication.

Recommendations for further study include: Why do students abandon their AAC devices? How many of the reasons for abandonment are directly related to school support? To what degree can increased teacher, SLP and other team member training decrease device abandonment? How does care giver involvement paired with school support impact AAC success or abandonment? Which of these issues are the responsibilities of the school? Answers to these questions are likely to be as varied as the

personalities of the individuals who use AAC, but a better understanding of these issues may ultimately aid in an increase in positive educational outcomes for students who use AAC.

Summary

While it is accepted that best practice for the implementation and support of AAC services are team-based, it is vital that each team has a leader. It should also be accepted that the leader may change based on the task at hand. It is neither practical nor realistic to expect a professional who is in the building on a monthly basis or less to assume responsibility for tasks that require more frequent attention. It is also not realistic to push aside a professional who is routinely in the classroom and who may have a great deal of responsibility for the overall academic progress of the student. The team must be able to function not only as a unit, but also as independent members. However, the final responsibility for each required task must be accepted by one person who will ensure its completion. Clarification of the roles of each team member, including when each member assumes the role as team leader or primary task support, will result in increased support for the student who uses AAC. Students who rely on AAC will increase their voice in their world.

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Appendix A: Survey

A Survey of Professionals who Support
Augmentative/Alternative Communication in the School Setting

The purpose of this survey is to answer several questions regarding decision making and support of augmentative-alternative communication devices in school settings. These questions center on current responsibilities, perceived roles, preferred roles and roles of others as they pertain to augmentative-alternative communication devices in the classroom.

Definitions:
Augmentative/Alternative Communication (AAC): Relates to any communication approach designed to support, enhance or supplement the communication of individuals identified as non-verbal.

Augmentative/Alternative Communication Intervention: "AAC intervention is the process of facilitating functional communication across all communicative contexts. Developing functional communication skills involves the use of multi-modal communication strategies. That is, an augmented communicator may learn to communicate using varied approaches including speech, communication boards, signs, gestures and high-tech devices. An important part of an AAC intervention program is to teach the augmented communicator the strategic competence to know when each communication modality or strategy is appropriate." (from: http://www.ussaac.org/INVENTION.html)

Student who is Nonverbal: Any student whose speech/spoken language is inadequate to meet their daily communication needs.

Section 1: Background Information

1. What is your professional title?
___ Teacher
___ Speech-Language Pathologist
___ Other (if "Other", thank-you for your time. You may stop here)

2. What is your highest college degree?
___ Bachelors degree ___ Masters degree ___ Doctoral degree
___ Other (Please specify) _____

What was your major area of study?

___ Special Education
- ___ LD
- ___ ED
- ___ASD
- ___ other _____

___ General Education
- ___ Pre-K, Kindergarten
- ___ Elementary
- ___ Secondary
- ___ Subject: specify _____

___ Speech-Language Pathology

___ Other, Please specify _____

3. How many years of professional experience in a school do you have?

___ 0-2 ___ 3-5 ___ 6-10 ___ 11 or more

4. How many years of the above experience include teaching/treating at least one student who is nonverbal?

___ 0-2 ___ 3-5 ___ 6-10 ___ 11 or more

5. Do you have any education in the area of AAC? ___ yes ___ no

If YES, how much? (Check all that apply)

- ___ 1 college course
- ___ 2 or more college courses
- ___ 1-8 hr. workshop/inservice
- ___ 1-3 day workshop
- ___ 1-4 presentations at a conference
- ___ 5 or more presentations at a conference
- ___ Read 1 book about AAC (beyond college course requirements)?
- ___ Read 2 or more books about AAC (beyond college course requirements)?
- ___ Other educational experiences (Please specify) _____

_____

_____

6. In which state did you obtain your highest degree? _____

7. In which state do you currently work? _____

KEY to abbreviations:

AT coord. = Assistant Technology Coordinator
Teacher = General or Special Education classroom teacher
OT = Occupational Therapist
SLP = Speech-Language Pathologist
PT = Physical Therapist

Section 2: Current responsibilities.

For each question, check one choice. If decisions are made by a team, check the team member who makes the final decision.

In your school(s), **WHO IS** primarily responsible to:

1. Decide which device is appropriate for the student?

   AT coord. Teacher OT SLP PT

2. Seek funding for the device?

   AT coord. Teacher OT SLP PT

3. Decide on device vocabulary?

   AT coord. Teacher OT SLP PT

4. Create overlays/symbols for the device?

   AT coord. Teacher OT SLP PT

5. Make sure device is ready for use?

   AT coord. Teacher OT SLP PT

6. Make sure student uses the device?

   AT coord. Teacher OT SLP PT

7. Update and maintain the device?

   AT coord. Teacher OT SLP PT

Section 3: Suggested Responsibilities.

For each question, check one choice. If team, check the choice you feel should be most responsible.

Who do you think **SHOULD BE** primarily responsible to:

8. Decide which device is appropriate for the student?

AT coord. Teacher OT SLP PT

9. Seek funding for the device?

AT coord. Teacher OT SLP PT

10. Decide on device vocabulary?

AT coord. Teacher OT SLP PT

11. Create overlays/symbols for the device?

AT coord. Teacher OT SLP PT

12. Make sure device is ready for use?

AT coord. Teacher OT SLP PT

13. Make sure student uses the device?

AT coord. Teacher OT SLP PT

14. Update and maintain the device?

AT coord. Teacher OT SLP PT

Section 4: Current training needs.

15. Do you have enough training to implement and support device usage?

Yes (skip to question 17) No

16. (If "No" for question 15), Where are the gaps in your training? Check all that apply

___ Knowledge of available devices
___ Knowledge of funding
___ Techniques to incorporate the device into curriculum
___ Strategies to incorporate the device into general classroom activities
___ How to select vocabulary
___ Development of appropriate overlays/symbols
___ How to prepare/set-up the device for use in the classroom
___ Device care and maintenance

17. Is there anything that prevents from doing what you think you are responsible to do? Check all that apply.

___Time
___Money
___Knowledge
___Administrative support
___Other, (please specify): _____

Section 5: Availability of professional support staff

18. How often is the AT coord. in the school? (check one)

No AT coord. Never Daily Weekly Monthly Quarterly I don't know

19. How often is the OT in the school? (check one)

No OT Never Daily Weekly Monthly Quarterly I don't know

20. How often is the SLP in the school? (check one)

No SLP Never Daily Weekly Monthly Quarterly I don't know

21. How often is the PT in the school? (check one)

No PT Never Daily Weekly Monthly Quarterly I don't know

I appreciate your taking time to answer these questions. Thank-you.

Curriculum Vitae

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Speech-Language Pathologist
Augmentative/Alternative Communication Specialist
103 Mulberry Avenue
Pasadena, Maryland 21122
Mezzomoang@aol.com
(347) 393-0663

CERTIFICATION:

Certificate of Clinical Competence: ASHA account number 01067168
New York State License: Speech-Language Pathology: number 005989
New Jersey State License: number YS003933
Maryland State License: number 04955
Public School Teacher Certificate – Teacher of the Speech and Hearing Handicapped; Permanent Certification in New York State: number 041601869

EDUCATION:

Walden University, Minneapolis, Minnesota (via online services): candidate for PhD in Special Education, ongoing, currently ABD
Teachers College, Columbia University, New York, New York: M.S. Speech-Language Pathology, 1988.
University of Connecticut, Storrs, Connecticut: B.A. Liberal Arts: Communication Sciences,1986.

EXPERIENCE: I have provided speech-language pathology services in a variety of settings. Services have included evaluation and therapy to individuals across the life span, with varying degrees of abilities and various clinical or medical diagnoses. Although able to work independently, I have frequently worked on transdisciplinary teams, provided supervision to undergraduate, graduate and Clinical Fellows. Services and responsibilities specific to a setting are listed with that setting.

In addition, I have provided Augmentative/Alternative Communication and Feeding/Oral Motor therapy to children and adults. These services included direct treatment, training parents, caregivers, support and classroom staff on the use of the equipment utilized by each individual and program devices with appropriate words, phrases and sentences.

Anne Arundel County Public Schools, Annapolis, Maryland
Speech-Language Pathologist
August 2010 - current

Educational Based Services, Philadelphia, Pennsylvania
Speech-Language Pathologist
August 2006-June 2010

Private Practice/Independent Contractor, Staten Island, New York
Speech-Language Pathologist/Augmentative Communication Specialist
Provide services to various agencies on Staten Island, including:

Speech Zone – Provide therapeutic services to children ages 3 to 10. January 2005-August 2006.
Office of Related and Contractual Services, Board of Education of New York City. September 1996 – August 2006.
Carmel Richmond Nursing Home – Consultative, supportive, evaluative and therapeutic services to residents requiring alternative means of communication. March 1999 – May 2005.
Institute for Basic Research - Provide consultative services regarding the evaluation of individuals with severe-profound multiple disabilities for use of assistive technology. Develop Assistive Technology Evaluation format; educate Project Leaders on current and evolving assistive technology and its applications to target consumer group. January 1999 – March 2000.
Independent Living Associations- Provide supervision to Clinical Fellows in the field of Speech-Language Pathology in accordance with the rules and regulations set forth by the American Speech-Language and Hearing Association. July 1997-1998.

Eden II School, Staten Island, New York
Senior Site Speech-Language Pathologist
June 2002 – September 2004.

CHAPS, Community Health and Preventative Services, a Division of Staten Island University Hospital, Staten Island, New York
Clinical Coordinator/ Augmentative Communication Specialist

Develop, implement and manage Clinical Quality Assurance Program for Outreach Services Department. Hire and supervise clinical staff. Establish and update quality indicators in accordance with funding and regulatory standards. Compile Quality Assurance reports for presentation to agency-wide Performance Improvement Coordinating Group. Work with subcontractors to ensure quality of clinical services and compliance with regulations. Provide ongoing trainings to clinicians and physicians, mentoring of speech-language pathologists and inservices to support staff. Develop

clinical policy and procedures, standardized forms and training manual. Additional responsibilities include provision and supervision of Augmentative/Alternative Communication and supervision of Clinical Fellows and staff therapists. As a Speech-Language Pathologist/Augmentative Communication Specialist, provide direct and indirect services focusing on communication and dysphagia needs for adults with Developmental Disabilities through the New Jersey Interdisciplinary Team Network. Additional responsibilities include staff training, program development, development of feeding protocols and ongoing inservices.

April 1998 – June 2002.

Renaissance Healthcare Options, Roslyn, New York (formerly SIUH Outreach Program)
Augmentative/Alternative Communication Specialist/Speech-Language Pathologist

Provide Augmentative/Alternative Communication services including evaluation, therapy and inservice training to individuals of varying ages and abilities. Perform traditional speech-language pathology services including assessment, therapy, bedside dysphagia evaluations, feeding protocols and Peer Review as requested. Develop and implement Augmentative/Alternative Communication Center to provide services to Staten Island and other communities as needed.

April 1992 - March 1998.

St. John's University/Notre Dame College, Staten Island, New York
Adjunct Professor

Teach undergraduate courses to speech-language pathology students. Courses include "Language Based Learning Disorders", "Communication Skills of Hearing Impaired Children", "Introduction to Speech Communication" and "Seminar on Professional Ethics." Supervise student interns during practicum field placement.
September 1996 - December 1998.

United Cerebral Palsy Associations of New York State, Inc., New York, New York
Coordinator of Clinical Speech and Rehabilitative Technology Services

Coordinate communication and technology services for Koicheff Clinic and Jerome Belson Center Clinic. Participate in interdisciplinary rehabilitation team. Provide evaluative and therapeutic services in the areas of augmentative/alternative communication and rehabilitation technology to individuals requesting these services. Member of Dysphagia Management Team. Supervise student interns and Clinical Fellows. Responsible for grant writing. Member of Interagency Technology Committee. Co-author of the UCPA/NYS Augmentative Communication Guide. Provide inservice training, workshops and presentations on technology and communication. Earlier

positions include Augmentative/Alternative Communication Specialist and Speech-Language Pathologist.
July 1988-June 1995.

United Cerebral Palsy Association of New York City, Staten Island, New York
Speech-Language Pathologist

Perform evaluative and therapeutic services to preschool age children with various disabilities. Participate in Conductive Education approach, provide interdisciplinary group therapy sessions and assist in the development of Augmentative and Alternative Communication training package.
April 1990-April 1991.