

THE INTEGRATION OF ASSISTIVE TECHNOLOGY WITHIN THE DAILY
EDUCATIONAL ENVIRONMENT

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF ARTS
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

SCHOOL OF OCCUPATIONAL THERAPY

BY

MARTHA M. ISKANDER, B.S.

DENTON, TEXAS


MAY 2008

TEXAS WOMAN'S UNIVERSITY
DENTON, TEXAS

November 16, 2007

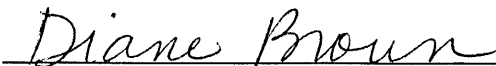

To the Dean of the Graduate School:

I am submitting herewith a thesis written by Martha M. Iskander entitled "The Integration of Assistive Technology within the Daily Educational Environment." I have examined this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts with a major in Occupational Therapy.



Catherine Candler, Ph. D., Major

Professor

We have read this thesis and recommend its acceptance:



Department Chair

Accepted:


Dean of the Graduate School

Copyright © Martha M. Iskander, 2008
All rights reserved.

ACKNOWLEDGMENTS

First and foremost I want to thank God, without Him this work would not have been achieved. I want to thank my father, Maher Sorial, who inspired and motivated me throughout my life with his humble heart, great love and strength. This thesis is dedicated to him. I wish to also express my appreciation to my mother, Meven Sorial, who provided me daily with inspiration and support. I want to thank my dear husband, Adel Iskander and son, Samuel for their enthusiastic encouragement and unlimited support, without them this thesis would not have been possible. I would like to express my deep thanks, appreciation, and grateful acknowledgment to my advisor Dr. Catherine Candler for her supervision, suggestions, and advisement; she helped me overcome many of the difficulties I encountered during my period of study at Texas Woman's University. I'm also deeply grateful to the help and support of Dr. Diane Brown, Co-Chair and great support in the completion of this project. I want to thank my sister Mariam Gerges and brothers Ishak and Michael Sorial for their continual support. Also I would like to extend my thanks to my in-laws Mr. Iskander F. Iskander and Mrs. Hoda Iskander for their continual prayers and support.

ABSTRACT

MARTHA M. ISKANDER

THE INTEGRATION OF ASSISTIVE TECHNOLOGY WITHIN THE DAILY EDUCATIONAL ENVIRONMENT

MAY 2008

A descriptive study was implemented to determine teachers' perception and the prevalence of factors that may influence the integration of assistive technology within the classroom of an urban school district. The study utilized a survey design to collect data from the teachers. Results from the study indicated that within this school district optimum factors existed within the classroom to support the integration of assistive technology and teachers had an overall positive perception regarding the use of AT. However, teachers reported less training with communication based devices and almost one third reported insufficient in-class assistance to support technology use.

TABLE OF CONTENTS

	Page
COPYRIGHT.....	iii
ACKNOWLEDGMENTS	iv
ABSTRACT.....	v
LIST OF TABLES.....	viii
LIST OF FIGURES	ix
Chapter	
I. INTRODUCTION	1
Statement of the Problem.....	1
Significance and Purpose of the Study	2
II. REVIEW OF LITERATURE.....	4
Legislation.....	4
Assistive Technology and Children	5
III. METHODOLOGY	9
Participants.....	9
Instrument	9
Data Collection Procedures.....	12
Data Analysis	12

IV. RESULTS	13
Profile of Respondents.....	13
V. DISCUSSION	28
Limitations of the Study.....	29
Implications for Future Research.....	30
Conclusion	30
REFERENCES	32
APPENDICES	
A. Educator Survey	37
B. Survey Responses and Assigned Scaled Score Value.....	42

LIST OF TABLES

Table	Page
1. Summary of Research Questions, Survey Questions and the Types of Data	10
2. Descriptive Statistics of Participants	13
3. Participants' Experience with Devices	14
4. Adequate Training on Specific Devices	17
5. Student-Teacher and AT Users-AT Non-users Ratio per Classroom.....	21
6. Summary of Student's Need for Physical Assistance/Setup to use their AT Device(s)	23
7. Summary of the Number and Types of Devices Used Daily in the Classroom.....	23
8. Number of Students with AT devices and Number of Students with IEP Documentation.....	25

LIST OF FIGURES

Figure	Page
1. Percentage of teachers indicating their level of confidence in the use of AT.....	15
2. Percentage of teachers indicating whether or not they have received training on the use of their students' AT	16
3. Percentage of teachers indicating whether or not they both enjoy and self teach on the use of AT.....	18
4. Percentage of teachers indicating whether they “always, occasionally or never” perceive the student’s AT device to be too complicated	19
5. Percentage of teachers indicating their ability to easily integrate AT use in their classroom.....	20
6. Percentage of teachers indicating whether or not there are an adequate number of adults to support AT use	21
7. Percentage of teachers reporting whether or not IEP documentation is present for the students who are currently using AT in their classroom....	25
8. Percentage of teachers reporting whether or not IEP documentation is important prior to the use of AT devices	27

CHAPTER I

INTRODUCTION

The use of assistive technology devices (AT) within school districts has grown over the past decade. The purpose of assistive technology is to assure that the student benefits optimally from the educational environment. Numerous studies have supported the idea that assistive technology benefits students by enabling social and emotional development, as well as cognition, social interaction, communication, academics, autonomy, exploratory play and independent behavior (Cowen & Turner-Smith, 1999; Hutinger, Johanson, & Stoneburner 1996; Reed & Kanny, 1993; Sullivan and Lewis, 2000). Another benefit of assistive technology is that students who once were unable to participate in a mainstream classroom are now able to do so (Hutinger et al., 1996; Todis & Walker, 1993). Despite the positive impact of assistive technology, educators struggle to integrate its use within daily classroom activities. The reason for this struggle is poorly documented in literature. There is little research examining the issue of integration of assistive technology within the educational environment (Moore & Wilcox, 2006).

Statement of the Problem

Recent changes to the Individuals with Disabilities Education Act (IDEA 2004) has forced school districts to consider each student for AT access, resulting in an increasing demand and pressure to use these devices in educational instruction (Sopko, 2003). However, with the growing demand of assistive technology with special needs

children, there is also a low rate of integration of these tools by teachers and support staff (Derer, Polsgrove, & Rieth, 1996). Minimal research has been devoted to study the perception of the usefulness of AT by teachers and the prevalence of common factors in the classroom that may influence the integration of AT.

Significance and Purpose of the Study

The purpose of this study was to identify within a single school district, teacher perceptions of the usefulness of AT in regards to 1) AT training, 2) the use of AT, 3) their ability to integrate the use of AT within normal classroom activities and, 4) the adequacy of assistance in the classroom to support AT use. The study also identified the prevalence of factors in the classroom that may influence the use of AT. These included 5) the average student-teacher ratio in the classroom, 6) the average AT users and AT non-users in the classroom, 7) the average number and types of devices used daily, and 8) the prevalence and importance of AT documentation within the student's Individual Educational Plan (IEP). Specifically, this study sought information concerning the following questions:

1. What is the adequacy of AT training as perceived by teachers within the school district?
2. What are teacher perceptions of the usefulness of AT?
3. What are teacher perceptions of their ability to integrate the use of AT?
4. What are teacher perceptions of the adequacy of in-classroom assistance to support AT use?

5. What is the average student-teacher ratio in the classrooms?
6. What is the typical ratio of AT users and AT non-users in the classrooms?
7. What is the average number and types of devices used daily in the classrooms?
8. What is the prevalence and perceived importance of AT documentation within the student's IEP?

CHAPTER II

REVIEW OF LITERATURE

Children with disabilities face challenges throughout their lives. Many of these challenges are related to their ability to access their environments, interact with others, and reach educational potentials (Cavet, 1995). With a rise in assistive technology use in the broad rehabilitative field, children who have been provided AT devices have achieved and even exceeded their expected potentials (Long, Huang, Woodbridge, Woolverton & Minkel, 2003). The Tech Act of 1998 (PL 105-394) defines assistive devices as any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.

Legislation

Legislation supporting AT has influenced its use, service delivery and accessibility. The initial law that directly involved AT use within the educational environment was the special education law of 1975 (P.L. 94-142). That law, known as the Education for All Handicapped Children Act, or the EHA, guaranteed that eligible children and youth with disabilities between the ages of 5 and 21 years would have a free and appropriate public education (FAPE). This law also introduced the Individual Educational Plan (IEP) and set provision on AT use within the classroom (Cook & Hussey, 1995). In 1990, the amendment to the Education for All Handicapped Children,

(PL 101-476) included AT as part of the student's education (Kellegrew, 1995). In 1997 Individuals with Disabilities Education Act (IDEA) (PL 105-17) was amended to mandate that each child would be considered for AT during the IEP process (Purcaro, 1997). With this amendment, schools were forced to consider each student with disability for AT services, giving them a new means of interaction and independence in their academic environment (Beck, 2002).

Assistive Technology and Children

When examining the dynamic process of assistive technology use with special needs children, the environment plays a major role in the success of its integration into daily activities. These environmental factors are often beyond the child's control. Copley and Ziviani (2004) conducted a review of literature to identify the potential barriers to AT assessment and implementation for children with multiple disabilities. The reviewed studies suggest there are multiple factors that contribute to AT disuse. The factors identified include deficits in the areas of 1) staff training and attitude (Carey and Sale, 1994; Derer, et al., 1996; Hutingner et al., 1994; Parker et al., 1990), 2) assessments issues (Margolis & Goodman, 1999), 3) planning issues (Fuhrer, Jutai, Scherer, & Deruyter, 2003), 4) funding issues (Cowan & Turner-Smith, 1999), 5) equipment issues (Kanny, Anson, & Smith, 1991; McGregor & Pachusk, 1996), and 6) time constraints (Carey & Sale, 1994; Derer et al., 1996, McGregor & Pachuski, 1996).

In the 1989-90 school year, 4,817,503 students with disabilities were served under Part B of the IDEA and Chapter 1 of the Elementary and Secondary Education Act (U.S.

Department of Education, 1992)—a 23% increase since 1976-77, the year in which IDEA first took effect (Fuchs & Fuchs, 1994). This increase in children with disability continued through the past decade to an estimated 5.2 million individuals between the ages of 5 and 20 as reported by the 2000 U.S. Census. With the number of special needs children at an all time high, the demand to provide suitable solutions is also on the rise. Given the difficulty of balancing classroom activities with a larger classroom size, educators are faced with the dilemma of time constraints in relation to using AT (Copley & Ziviani, 2004).

Time restraints and the absence of assistance in the classroom plays a great factor in the educator's ability to implement AT devices (Muir-Herzig, 2004). Many educators are often left with the burdensome task of obtaining the equipment, programming and installing it, and training themselves and then the students to apply the technology due to lack of in-class assistance (Copley & Ziviani 2004). A two year study by Huting et al. (1996) analyzed how assistive technology was used in educational programs and found that the amount of time spent on technology applications and competence of the teachers and support personnel were factors contributing to the integration of the devices within the classroom.

Another factor that may impact the level of integration of assistive devices is the presence of IEP documentation of its use. In 1975 Congress passed Public Law 94-142 ensuring that all eligible children with disability receive free appropriate public education design to meet their educational needs (Sopko, 2003). The IEP became a vital legal

document, mandating the development of highly organized, planned and teacher directed activities in the classroom derived from initial testing and individualized goals set in an annual meeting (Thies & Uran, 1981). The reauthorization in 1997 to IDEA emphasized that the IEP needs to be a dynamic document that clearly shows how to specially design program for each child with disability (Burns, 2001). The reauthorization also emphasized the access to assistive technology for all eligible students. Therefore, mention of AT evaluation and use within the IEP document must be carried out within a specific time frame. Copley and Ziviani (2004) found that lack of integration of assistive technology into classroom curriculum is related to limited mention of its use in the student's IEP. The study also discovered that when documentation of assistive device use is present within the IEP report, there is limited information on how the technology should be applied to achieve wider educational goals. Therefore, specific plan for AT evaluation and use within the IEP document is necessary for the educator to receive instruction, training and support for the device use within classroom activities.

The requirements in IDEA to consider AT devices and services for all students with disabilities created a massive task for educators who often viewed AT use exclusively within the rehabilitative or remedial context (Warger, 1998). A review of literature by Sopko (2003) regarding training of special education teachers on the use of AT devices revealed that some states received 24 hours of training while in other states teachers felt inadequately prepared and lacked competency to use the assistive devices. Due to this feeling of incompetence, educators are less likely to integrate AT devices. A

study by Hutinger, et al. (1996) revealed that AT was viewed by school staff as an alternative way to develop isolated academic skills, rather than as a tool to integrate into daily activities, as they were often used as individual activities that were neither necessarily developmentally appropriate nor related to the ongoing day-to-day activities in the classroom or at home. This study also highlighted that staff and family technology competency varied across groups as did the amount and intensity of staff and family training, leading to abandonment of the devices as some children in the study moved within schools/programs. The researchers found that in spite of past training opportunities and experiences, staff noted the lack of personal training and technology support services as a barrier to implementation. Identified issues centered on 1) difficulties in program planning with adaptive equipment, 2) lack of training and information, 3) lack of communication between staff members, and 4) inadequate assessments (Hutinger, et al. 1996).

As noted in current literature, the factors of the amount of resources available to the educational team, the presence of documentation in the IEP report of AT use, and the educational team's perception regarding the value of device as well as their competency in operating it play a vital role in the integration of AT devices in the classroom (Copley & Ziviani, 2004).

CHAPTER III

METHODOLOGY

A non-experimental survey design was used for this pilot study to gather data regarding environmental factors and teacher perceptions that may influence the integration of AT into normal classroom activities. This study utilized descriptive analysis of the data as pertains to the research questions (Table 1).

Participants

The participants for this project are special education school teachers. The researcher utilized a sample of convenience of special education teachers in the selected school district. Prior to survey distribution, written permission was obtained from the school district as well as the approval from the Texas Woman's University Institutional Review Board. Participants who had less than 1 year experience working as instructors in special education were excluded from this project. Participation in the study was voluntary. To ensure confidentiality and anonymity, the survey did not contain any questions requiring the participants to volunteer any personal information and was collected by postal service using self addressed envelopes to the researcher.

Instrument

Survey design provides a quantitative or numeric description of trends, attitude, or opinion of a population by studying a sample of that population (Creswell, 2003). The survey began with questions about demographics, years of teaching experience, number

of children in classroom, number and type of assistance in the classroom, number of students using AT, etc. The next section of the survey asked the educator to indicate experience and training with specific AT devices commonly used in the classroom. The remainder of the survey contained 12 questions designed to examine the eight research questions. The 12 questions included yes/no questions, as well as questions with scaled responses (always, occasionally and never). Additional space was provided at the bottom of the survey allowing the educator to communicate any further information related to assistive technology that was not covered by the questions (See Appendix A).

Table 1

Summary of Research Questions, Survey Questions and the Types of Data

Research Question	Survey Question	Type of Data
1. What is the adequacy of AT training as perceived by teachers within the school district?	1	Ordinal
	3	Categorical
2. What are teacher perceptions of the usefulness of AT?	2	Categorical
	4	Ordinal
3. What are teacher perceptions of their ability to integrate the use of AT?	5	Ordinal

4. What are teacher perceptions of the adequacy of in-classroom assistance to support AT use?	6	Categorical
5. What is the average student-teacher ratio in the classrooms?	Demographic Data	Ratio
6. What is the typical ratio of AT users and AT non-users in the classrooms?	7	Ratio
7. What is the average number and types of devices used daily in the classrooms?	8	Ratio
	9	Ratio
8. What is the prevalence and perceived importance of AT documentation within the student's IEP?	10	Categorical
	11	Ratio
	12	Categorical

Data Collection Procedures

Two hundred surveys were mailed out to local educators. The surveys were distributed by postal service. Surveys were mailed to all special education teachers who fit the specific criteria for participation at their schools from a comprehensive list obtained by administration. The packet included the survey instrument, an introductory letter explaining the purpose of the study and insuring anonymity and confidentiality, and a postage-paid return envelope. Participation in the survey indicated consent. Participants were given the opportunity to indicate that they had not been in contact with any students who use assistive technology. Non-respondents follow-up was not used and data collection was cut off six weeks after the initial mail out of the surveys.

Data Analysis

Information collected was grouped and analyzed collectively after all questionnaires were completed and returned. Prior to analysis, a scaled value was assigned to the responses of scaled questions as shown in Appendix B. Using the scaled scores, descriptive statistics was obtained using Minitab Statistical Software.

CHAPTER IV

RESULTS

Profile of Respondents

A total of 52 surveys were completed and returned from the educators targeted in the study. Nine surveys were excluded from the study because they were completed by educators in their first year of teaching. Of the 43 participants, 19 (44%) had a Masters degree and 24 (56%) had a Bachelors degree. Table 2 provides descriptive statistics about the years of work experience, level of education, and grade currently teaching.

Table 2

Descriptive Statistics of Participants

	PK (<u>n</u> =11)	K-5 th (<u>n</u> =21)	6 th -8 th (<u>n</u> =5)	9 th -12 th (<u>n</u> =6)
Years of experience in the school setting				
Mean	11.73 yrs.	12.43 yrs.	13.60 yrs.	14.67 yrs.
Range	2-30 yrs.	2-29 yrs.	3-30 yrs.	5-28 yrs.
Master Degree	3	9	1	5
Bachelors Degree	8	12	4	1

Table 3 outlines the specific types of devices commonly used in the classroom.

Analysis of data indicated that all 43 surveyed teachers were currently using AT in their classroom

Table 3

Participants' Experience with Devices

Devices	PK (<u>n</u> =11) %		K-5 th (<u>n</u> =21) %		6 th -8 th (<u>n</u> =5) %		9 th -12 th (<u>n</u> =6) %	
Manual Wheelchair	7	64%	15	71%	3	60%	5	83%
Power Wheelchair	5	45%	16	76%	3	60%	5	83%
Positioning Equipments	6	55%	12	57%	4	80%	3	50%
Sensory Processing Devices	7	64%	13	62%	4	80%	2	33%
Static/Dynamic Communication Devices	5	45%	9	43%	3	60%	3	50%
Computer Adaptation	5	45%	10	48%	3	60%	1	17%
Switch Operated Toys	4	36%	8	38%	1	20%	0	0%
Other	2	18%	0	0%	0	0%	0	0%

What is the adequacy of AT training as perceived by teachers within the school district?

To address this research question, survey items 1 and 3 were used. In the first survey question, teachers were questioned about their overall confidence and proficiency in using AT devices. As illustrated in figure 1, nearly 73 percent of the educators

surveyed reported feeling “always” confident and proficient in using the students’ AT device(s), while 27% indicated that they “occasionally” felt confident and proficient. None of the surveyed educators indicated that they “never” felt confident and proficient with AT use.

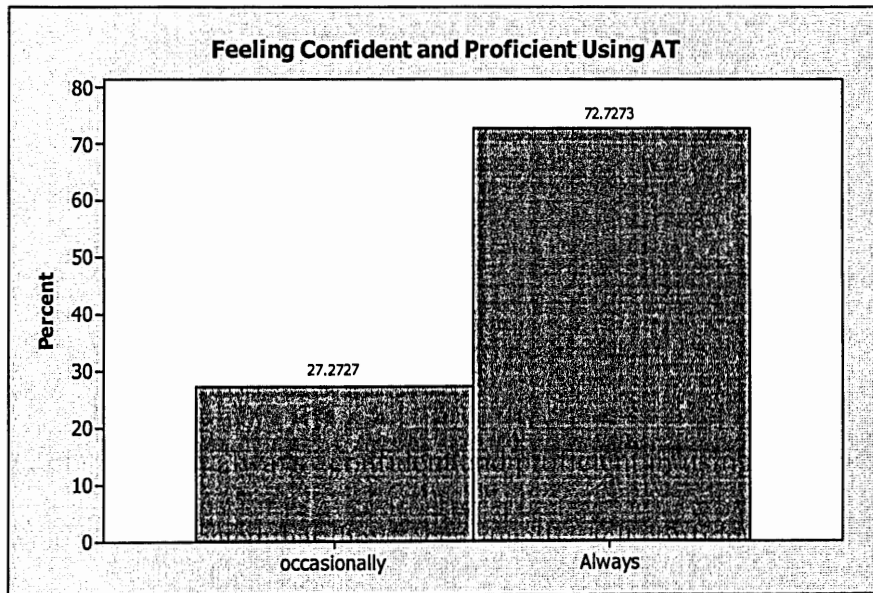


Figure 1. Percentage of teachers indicating their level of confidence in the use of AT.

Item #3 of the survey questioned whether or not the educators had received training from a professional on the use of the students’ AT.

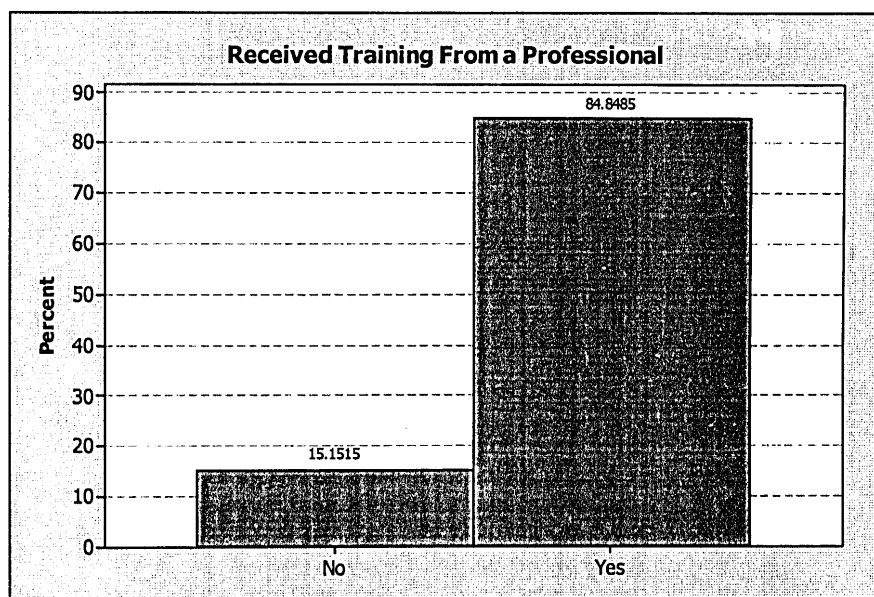


Figure 2. Percentage of teachers indicating whether or not they have received training on the use of their students' AT.

Data shown in figure 2 indicate that 85% reported that they had received training from a professional on the device(s) used by the student(s) in their classroom, while only 15 percent indicated that they had not received training.

Further information related to this question was gathered by the analysis of the specific technology training received by the educators (Table 4).

Table 4

Adequate Training on Specific Devices

Devices	N	%
Manual Wheelchair	34	80%
Power Wheelchair	36	83%
Positioning Equipments	36	83%
Sensory Processing Devices	34	80%
Static/Dynamic Communication Devices	30	70%
Computer Adaptation	28	67%
Switch Operated Toys	29	68%
Other	2	5%

Results indicate that 82% reported adequate training with mobility and positioning devices, while 68% reported adequate training with communication/computer adaptation based devices. More training was identified for positioning/mobility devices, however, educators indicated a greater prevalence of communication based devices in the classroom.

What are the teacher's perceptions of the usefulness of AT?

To address this research question, survey items 2 and 4 were used. Survey question #2 inquired whether or not the teachers enjoy and self teach on AT use.

Responses to this question indicated that the majority (94%) of the surveyed teachers enjoy the use of AT and teach themselves on its use.

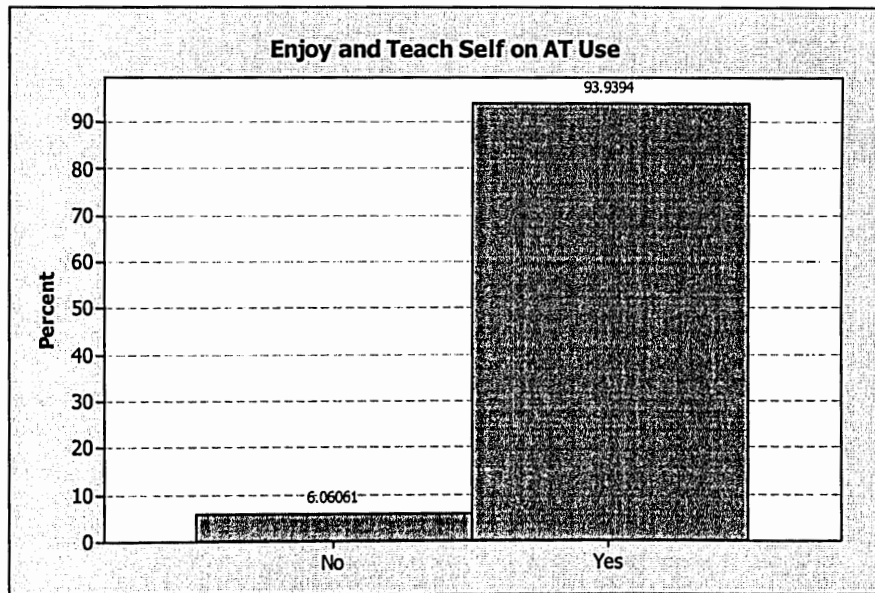


Figure 3. Percentage of teachers indicating whether or not they both enjoy and self teach on the use of AT.

Survey item number 4 was also used to address the second research question. In this item, teachers were asked whether or not the students' AT devices were generally too complicated (figure 4). Results from this survey question indicate that nearly 92% of all teachers reported that they "occasionally" or "never" perceive the students' device to be too complicated for use, while only 8% of the respondents reported that they "always" perceive the device(s) to be too complicated.

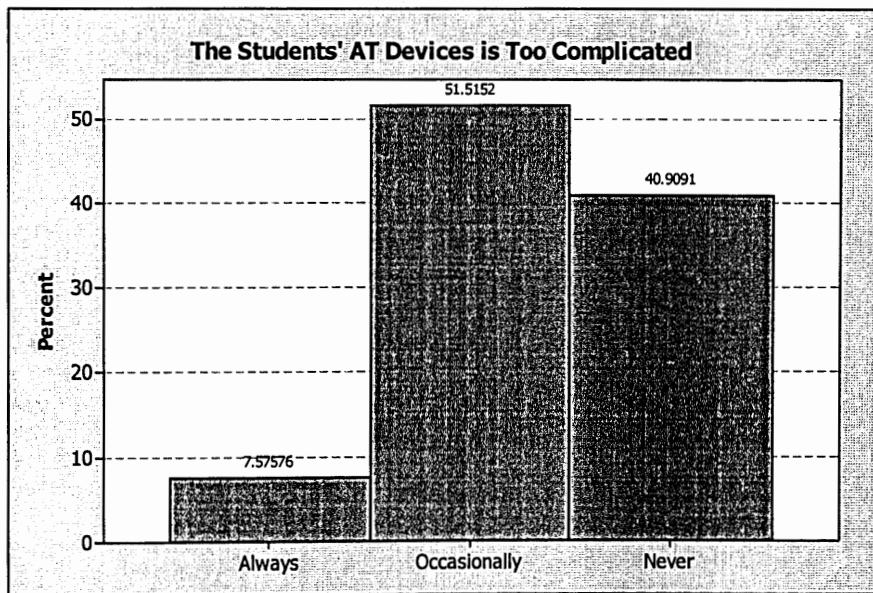


Figure 4. Percentage of teachers indicating whether they “always, occasionally or never” perceive the student’s AT device to be too complicated.

What are teacher perceptions of their ability to integrate the use of AT?

Item 5 of the survey was used to address this question. Teachers responded to the statement “I can easily integrate the use of assistive technology devices into normal classroom activities.” While none of the respondents reported that they strongly disagree with this statement, 6% reported that they disagree. However, the majority (94%) of teachers stated that they either agree or strongly agree that they can integrate AT use in the classroom (figure 5).

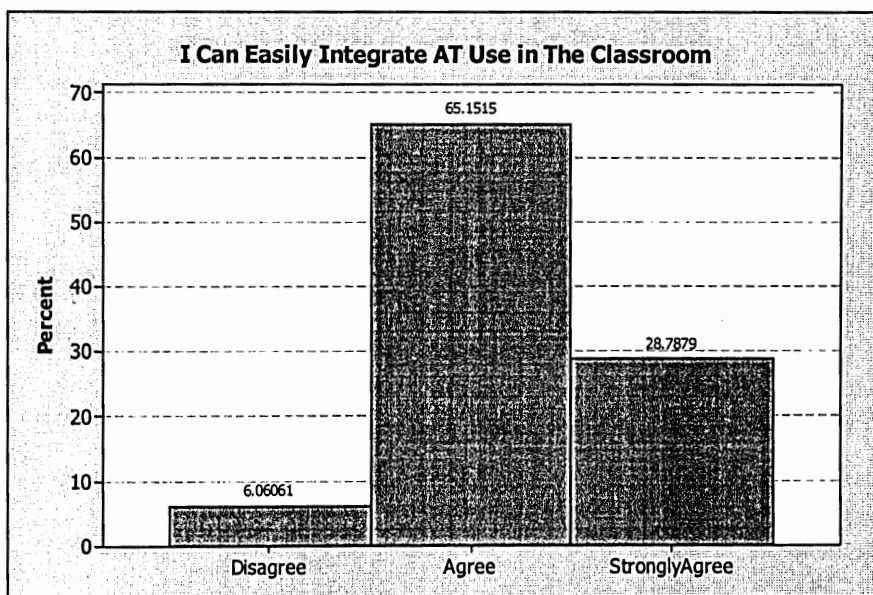


Figure 5. Percentage of teachers indicating their ability to easily integrate AT use in their classroom.

What are teacher perceptions of the adequacy of in-classroom assistance to support AT use?

Survey item 6, which states “There are an adequate number of adult assistants in the classroom to support the students use of assistive devices in the classroom”, was used to determine teachers’ perception of the adequacy of in-class assistance. Analysis of this survey item indicated that 29% of teachers reported inadequate assistance in the classroom to support the integration of AT use, while 71% agreed that there is an adequate support (figure 6).

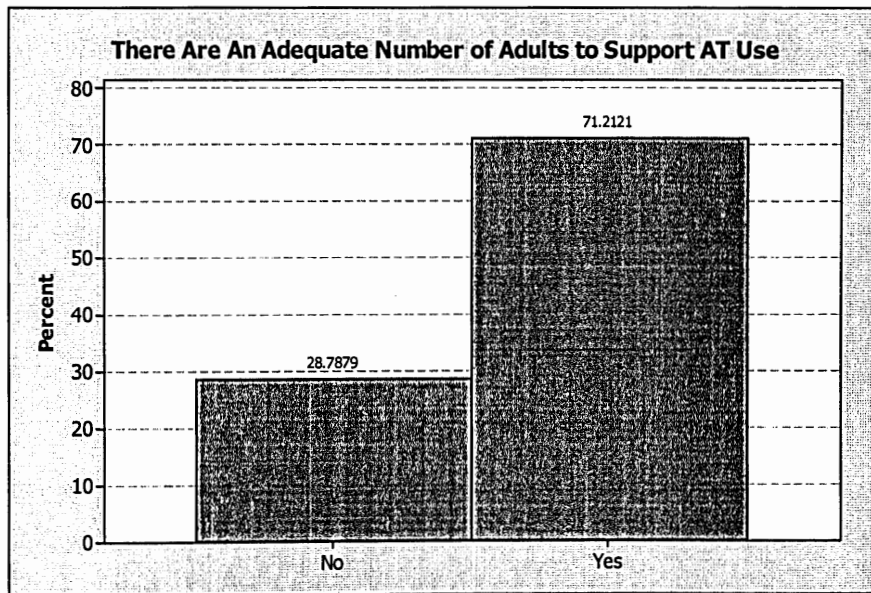


Figure 6. Percentage of teachers indicating whether or not there are an adequate number of adults to support AT use.

What is the average student-teacher ratio in the classroom?

To determine the average student-teacher ratio in the classroom, demographic data provided by the teachers in the survey were analyzed (table 5).

Table 5

Student-Teacher and AT Users-AT Non-users Ratio per Classroom

	Mean	St.Dev.	Min	Max
Students	11.11	5.90	3	25
Adults	2.60	.90	1	5
AT Users	5.62	3.30	1	13
AT Non-Users	5.51	6.97	0	23

The average classroom size contains 11 students with an average of 2.6 adults, resulting in a ratio of 1 adult per 4 students. However, data also indicated a wide range in classroom size, with a minimum of 3 and a maximum of 25.

What is the typical ratio of AT users and AT non-users in the classroom?

Demographic data provided by the teacher indicating the total number of students in the classroom and the number of those who use AT were used to address this research question. As outlined in table 5, a one to one ratio of AT users and AT non-users was determined from the provided data. The mean number of AT users (5.62) and AT non-users (5.51) is almost equal, however, more variability across classrooms was noted for AT non-users verses AT. It is important to note that out of 43 surveyed classroom, 7 were indicated to be “inclusion” classroom, which typically includes an even or greater number of regular education students for every special education student in the classroom. Inclusion classrooms are generally greater in size, averaging 23 students. This is much greater than the smaller, self-contained classroom, where AT is mostly used and the average classroom size is 11.

To further examine the classroom dynamic, it is also important to determine the ratio between students who require physical assistance to access their device and those who are independent with the use of their device. Data from survey item 7 were analyzed to determine this factor. Table 6 outlines the result:

Table 6

Summary of Student's Need for Physical Assistance/Setup to use their AT Device(s)

	Mean	St.Dev.	Min	Max
Require Assistance/Setup	2.95	2.78	0.0	10
Does Not Require Assistance/Setup	3.35	4.01	0.0	15

The difference between students who require and those who do not require assistance/setup to access their devices was not large, with slightly more students able to independently access their devices.

What is the average number and type of devices used daily in the classroom?

Survey item 8 and 9 were used to gather information from the teachers regarding the average number and type of devices used daily in their classroom. Table 7 summarizes the data provided by the educators:

Table 7

Summary of the Number and Types of Devices Used Daily in the Classroom

	Mean	St.Dev.	Median	Min.	Max
Number of Devices	4.95	3.76	4.0	0.0	17.0
Positioning Devices	1.42	1.76	1.0	0.0	6.0
Communication Devices	4.23	0.54	4.0	0.0	13.0

Educators indicated more communication devices in the classroom verses positioning devices. Communication devices often include static devices such as the Picture Exchange Communication System and dynamic devices such as a computer operated augmentative communication devices. It is important to note that the surveyed teachers had previously indicated more adequate training with mobility/positioning devices and less training with communication based devices.

What is the prevalence and perceived importance of AT documentation within the student's IEP?

Data gathered from teacher's responses to survey item 10, 11 and 12 were analyzed to identify the prevalence and importance of IEP documentation for AT use. Survey item 10 asked teachers whether or not all students in the classroom who use AT have it documented in their IEP. Results indicate that 83% of all surveyed teachers reported that their students who use AT in their classroom have the IEP documentation reinforcing its use, while 17% indicate that IEP documentation is not present (figure 7).

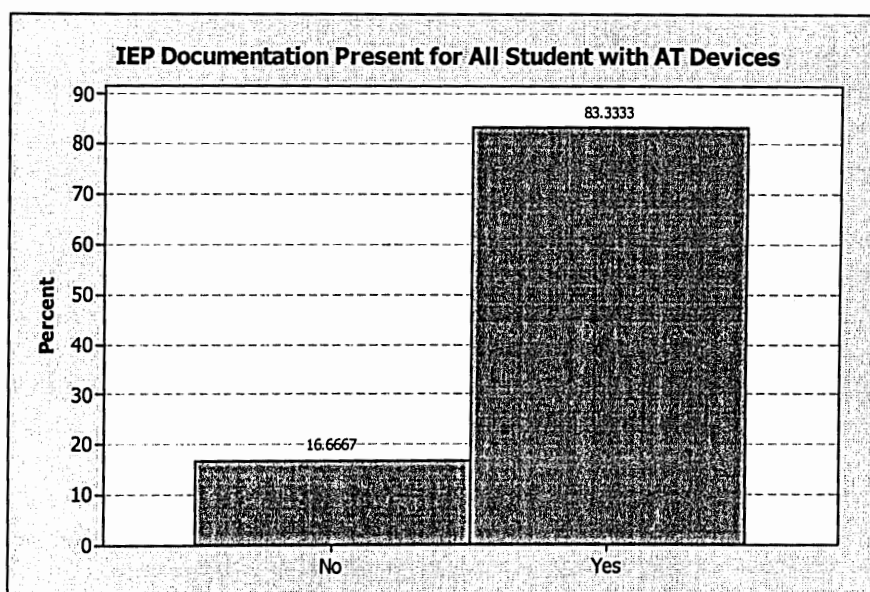


Figure 7. Percentage of teachers reporting whether or not IEP documentation is present for the students who are currently using AT in their classroom.

The following survey question asked teachers to report the total number of students who currently use AT and also have the necessary IEP documentation. This number was analyzed and compared to the total number of students who use AT, as reported in the demographic portion of the survey. Table 8 summarizes the provided data:

Table 8

Number of Students with AT Devices and Number of Students with IEP Documentation

Students	Mean	St. Dev.	Median	Min.	Max
Students with AT Device	5.60	3.29	6.0	1.0	13.0
Students with IEP Documentation	4.26	0.52	3.0	0.0	13.0

The mean number for students who use AT devices was higher than those with IEP documentation, indicating that not all students who use AT have the necessary IEP documentation supporting its use. Results from this survey question validate responses to the previous survey question (#10), where 17% of the surveyed teachers indicated that IEP documentation is not present for the students who are currently using AT.

The final survey question (#12) relating to IEP documentation asked teachers whether or not IEP documentation for AT use is necessary prior to using the device with the student in the classroom. Of the 43 participants, 55% reported that IEP documentation is not necessary for AT use, while 45% indicate its necessity (figure 8).

Results from this question disclosed teachers' perception towards the importance of the IEP documentation. While the presence of the IEP documentation legally binds the educators to use the device in the classroom, it appears that more than half of surveyed teachers are willing to use the devices without any binding documentation in order for the student to access his/her environment.

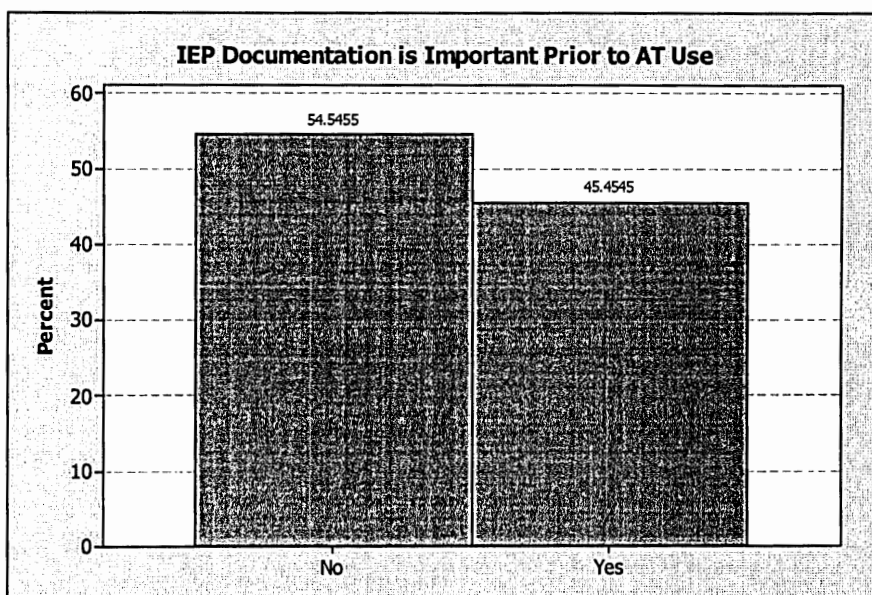


Figure 8. Percentage of teachers reporting whether or not IEP documentation is important prior to the use of AT devices.

CHAPTER V

DISCUSSION

This study presents with results of a survey investigating various factors that contribute to the integration of AT within an urban school district. Analysis of teachers' responses to the survey questions indicated the presence of optimum factors within the classroom supporting the teachers' use of assistive devices. These factors included an overall positive perception on behalf of the teachers regarding the usefulness of the students' AT, their ability to integrate the devices within their classroom, and the training they had received from a professional on AT use. When asked about the adequacy of in-classroom assistance, 71% reported that there is an adequate support within the classroom to integrate AT; however, almost one third of the teachers perceived assistance to be insufficient to effectively use the devices with the required students. This is an area that requires focus from school administrators to determine the sufficient amount of assistance required to support the teacher in the process of device use.

Another positive finding from the study was the student-teacher ratio and the AT users and AT non-users ratio. The average student-teacher ratio of 1:4 and the 1:1 ratio between AT users and AT non-users in the classroom are optimal for integration. These ratios suggest that there is an even distribution of AT users within the classroom as well as overall ideal student-teacher ratio present in the classroom. Of the 43 surveyed classrooms, seven were reported to be "inclusion" which frequently contains a higher

number of “typical” developing role model students compared with those who have special needs. However, upon analysis of individual surveys, the consensus did reflect the stated ratio.

When asked to report the number and types of devices used in the classroom, teachers reported a higher prevalence of communication based devices verses mobility/positioning based devices. However, when asked about the adequacy of training on commonly used devices, teachers clearly reported less training with communication devices despite their higher prevalence in the classroom. It is of great importance that the school district reassess the adequacy of training with communication based devices and provide the needed training to support teachers’ understanding on use and ways to incorporate within normal classroom activities.

An interesting finding from the study had to do with the importance of IEP documentation. Given the fact that IEP documentation is necessary and legally binds the school to implementation, teachers surprisingly reported their willingness to incorporate AT without it. The majority of teachers did report that IEP documentation is present with those who are currently using AT; however, more than half, 55%, said that the documentation is not necessary prior to implementation. It can be concluded also from this question that teachers have a positive view of the importance of AT as it relates to their student’s ability to access their environment and participate in the classroom.

Limitations of the Study

There was a low rate of survey return in this study, approximately 22%. This is not a sufficient sample size to draw a definite conclusion regarding a very large school

district like the one utilized in this study. The limited number of returned surveys also prevented more statistical analysis of the provided data. Another limitation of the study relates to the convenience sampling used. Randomized sampling would guarantee even and equal distribution of the surveyed population. Other limitations of this study consist of the self-report nature of the survey instrument utilized and the voluntary nature of responding. It is possible that the teachers who volunteered to participate in the study wanted to be perceived as being effective and involved with their students' AT.

Implications for Future Research

Future research on issues related to the integration of AT with the classroom in urban school settings is greatly needed. Further descriptive research and exploratory studies should be implemented in order to determine the perception of not only the special education teacher, but other school support staff, such as occupational therapist and speech-language pathologists who work closely with students. Their input can provide an unbiased view of the student's experience with assistive technology in the classroom. Information regarding others' perceptions of the teacher's ability to integrate AT in the classroom will undoubtedly cast a light on this problem. Another area for future research could investigate the impact of parent involvement in their child's school on the rate of device use in the classroom.

Conclusion

The integration of AT within the classroom has been of concern during recent years. In order for assistive technology to be integrated fully within the classroom, various factors must be in place to support teachers' use of technology. Overall, this

study supports the conclusion that the optimum factors do exist within this urban school district, making it an ideal environment for teachers to incorporate AT within their normal classroom activities. However, two areas were identified which require further focus, these include the adequacy of in-classroom assistance and the need for increased training with communication based devices due to their high prevalence in the classroom.

REFERENCES

- Beck, J. (2002). Emerging literacy through assistive technology. *Council for Exceptional Children, 35*(2), 44-48.
- Burns, E. (2001). *Developing and implementing IDEA IEPs: An Individualized Education Program Handbook for Meeting Individuals with Disabilities Education Act (IDEA) Requirements*. Springfield, IL: Charles C. Thomas Publishers.
- Carey, D., & Sale, P. (1994). Practical consideration in the use of technology to facilitate the inclusion of students with severe disabilities. *Technology and Disability, 3*(2), 77-86.
- Cavet, J. (1995). Sources of information about the leisure of people with profound and multiple disabilities. In Hogg, J. (Ed.) *Making Leisure Provision for People with Profound Learning and Multiple Disabilities*. London: Chapman and Hall, pp. 3-26.
- Cook, A., Hussey, S. (1995). *Assistive technologies: Principles and practice*. St. Louis, Missouri: Mosby Year-Book, Inc.
- Copley, J., & Ziviani, J. (2004). Barriers to the use of assistive technology for children with multiple disabilities. *Occupational Therapy International, 11*(4), 229-243.

- Cowen, D., & Turner-Smith, A. (1999). The user's perspective on the provision of electronic assistive technology: Equipped for life? *British Journal of Occupational Therapy*, 62(1), 2-6.
- Creswell, J. (2003). *Research Design: Qualitative, Quantitative and Mixed Method Approaches*, 2nd Edition. Thousand Oaks, CA: Sage Publications.
- Derer, K., Polsgrove, L., & Rieth, H. (1996) A survey of assistive technology and applications schools and recommendations for practice. *Journal of Special Education Technology*, XIII (2), 62-80.
- Fuchs, D & Fuchs, L. (1994). Inclusive schools movement and the radicalization of special education reform. *Exceptional Children*, 60, 294-309.
- Fuhrer, M., Jutai, J., Scherer, M., & Deruyter, F. (2003). A framework for the conceptual modeling of assistive technology devices outcomes. *Disability and Rehabilitation*, 25 (22), 1243-51.
- Hutinger, P., Hall, S., Johansen, J., Robinson, L., Stonburner, R., & Wisslead, K. (1994). State of practice: How assistive technologies are used in educational programs of children with multiple disabilities. A final report for the project: Effective use of technology to meet educational goals of children with disabilities (Report—research/technical 143). Washington, DC: Western Illinois University, Macomb.
- Hutinger, P., Johanson, J., & Stoneburner, R. (1996). Assistive technology applications in educational programs of children with multiple disabilities: A case study report on the state of the practice. *Journal of Special Education Technology*, XIII (1), 16-35.

- Kanny, E., Anson, K., & Smith, R. (1991). A survey of technology education in entry-level curricula: Quantity, quality and barriers. *Occupational Therapy Journal of Research, 11*, 311-19.
- Kellegrew, D. (1995). Integrated school placement for children with disabilities. In R. L. Koegel, & L. K. Koegel (Eds.), *Teaching children with autism: Strategies for initiating positive interactions and improving learning opportunities* (pp. 127-146). Baltimore, MD: Paul H. Brookes Publishing Co.
- Long, T., Huang, L., Woodbridge, M., Woolverton, B, & Minkel, J. (2003). Integrating assistive technology into an outcome-driven model of service deliver. *Infants and Children, 16*, 272-283.
- Margolis, L., & Goodman, S. (1999). AT services for students: What are these? Special Edition of Tech Express (ERIC Document Reproduction Service No. ED437800). Washington, DC: United Cerebral Palsy Associations.
- McGregor, G., & Pachuski, P. (1996). Assistive technology in schools: Are teachers ready, able, and supported? *Journal of Special Education Technology, XIII* (1): 4-15.
- Moore, H. & Wilcox, M. (2006). Characteristics of early intervention practioners and their confidence in the use of assistive technology. *Topics in Early Childhood Special Education, 26* (1), 15-23.
- Muir-Herzig, Rozalind. (2003). Technology and it's impact in the classroom. *Computers And Education, 42*, 111-131.

- Parker, S., Buckley, W., Truesdell, A., Riggio, M., Collins, M., & Boardman, B. (1990). Barriers to the use of assistive technology with children: A survey. *Journal of Visual Impairment and Blindness*, 54, 532-533.
- Purcaro, K. (1997). *IDEA summary*. Retrieved August 14, 2006, from http://www.asha.org/professionals/governmental_affairs/idea_overview.html
- Reed, B., & Kanny, E. (1993). The use of computers in school system practice by occupational therapists. *Physical and Occupational Therapy in Pediatrics*, 13(4), 37-55.
- Sopko, K. (2003). The IEP: A synthesis of current literature since 1997. *Alexandria, VA: National Association of State Directors of Special Education, Project Forum*. (ERIC Document Reproduction Service No. ED 476559)
- Sullivan, M., & Lewis, M. (2000). Assistive technology for the very young: Creating responsive environment. *Infants and Young Children*, 12(4), 34-52.
- Thies, A., & Unrein, J. (1981). Preserving education: Policies and procedure for individual educational Plans. *Journal of Learning Disabilities*, 14(6), 335-367.
- Todis, B., & Walker, H. (1993). User perspective on assistive technology in educational settings. *Focus on Exceptional Children*, 26(3), 1-16.
- U.S. Department of Education, Office of Special Education Programs (OSEP). (n.d.). *Data Analysis System*. Retrieved on February 8, 2007, from <https://www.ideadata.org/index.html>

U.S. Department of Education, Office of Special Education and Rehabilitative Services.

(n.d.). *Assistance to states for the education of children with disabilities and preschool grants for children with disabilities*. Retrieved August 14, 2006, from <http://www.ed.gov/legislation/FedRegister/finrule/2006-3/081406a.pdf>

Warger, C. (1998). Integrating assistive technology into the standard curriculum. Reston, VA: Clearinghouse on Disabilities and Gifted Education. (ERIC Document Reproduction Service No. ED426517).

APPENDIX A
Educator Survey

Dear Educator,

I am a graduate student in the school of Occupational Therapy at Texas Woman's University. As part of my Master Thesis research study, I am conducting an assistive technology survey for elementary school special educational teachers to better understand the factors that relate to the use of assistive technology devices in the classroom.

The purpose of this study is to examine the factors which contribute to the integration of assistive technology in the classroom. Teachers are often faced with the challenge of incorporating assistive devices into the daily academic activities as well as managing other needs and students in the classroom. Therefore, your input in this study will be invaluable in assisting me to in identifying ways to improve the integration of assistive technology in the classroom.

The return of the survey will indicate your consent to participate in the study. Your participation will be anonymous; you may withdraw at any time. The provided information will be collected and analyzed when all surveys are returned. The survey should only take 10 minutes of your time to complete. Please feel free to add more comments at the conclusion of the survey.

Your participation is greatly appreciated as it will contribute to the completion of this research project and to knowledge in the field of assistive technology. If you have any further questions or need further information, please feel free to contact me at Msiskander@gmail.com.

Sincerely,

Martha Iskander, OTR/L

ASSISTIVE TECHNOLOGY SURVEY

Date of Survey: _____

Formal Job Title: _____ Grade Currently Teaching: _____

Highest Degree Obtained: _____ Years Experience in special education: _____

Total number of Students in classroom _____

Number of adults in classroom: _____ Teacher: _____ Teacher aides: _____

Volunteers: _____ Parents: _____ Others: _____

Number of Students in classroom currently using assistive technology devices: _____

Please indicate in the chart below the number of students currently using the listed devices and whether you have received adequate training on the device. Please indicate N/A where it's not applicable to your classroom.

Type of Devices	Number of Students Currently Using Device in Classroom	I Received Adequate Training On This Device (Yes / No / NA)
Manual Wheelchair		
Power Wheelchair		
Positioning equipments (chair, stander, wedge, etc.)		
Sensory Processing Devices (tactile, vestibular, proprioceptive devices)		
Static/Dynamic Communication Devices (*)		
Computer Adaptations: Alpha Smart, Touch Screen, Adapted Keyboard, etc.		
Switch operated toys		
Other:		

(*) Static displays are those on which the symbols do not change automatically. Dynamic displays are those on which the language symbols change automatically as a normal part of operating the device

Please answer the following questions based on your experience with assistive technology (AT):

1. I feel confident and proficient using the student AT devices in my classroom
Always _____ Occasionally _____ Never _____
2. I enjoy assistive technology and I often teach myself how to use the various devices.
Yes _____ No _____
3. I received training from professionals on the use of the student AT devices in the classroom.
Yes _____ No _____
4. The students' AT devices are generally too complicated to use.
Always _____ Occasionally _____ Never _____
5. I can easily integrate the use of assistive technology devices into normal classroom activities.
Strongly agree _____ Agree _____ Disagree _____ Strongly Disagree _____
6. There are an adequate number of adult assistants in the classroom to support the students use of assistive devices in the classroom.
Yes _____ No _____
7. In my classroom there are _____ (number) of students that require physical assistance/setup to access their device(s). There are _____ (number) of students who don't require physical assistance/setup to access their device(s).
8. In my classroom there are _____ (number) of adaptive devices used daily in the classroom.
9. In my classroom there are _____ (number) of students with positioning equipment. There are _____ (number) of students with communication devices.
10. All students in my classroom who use assistive devices have it documented in their IEP.
Yes _____ No _____
11. The total number of students with Assistive Technology recommendations in their IEP _____.

12. An IEP recommendation for assistive device is necessary prior to using device with the student in the classroom

Yes _____ No _____

13. Additional comments regarding use and integration of assistive technology that you would like to share

APPENDIX B

Survey Responses and Assigned Scaled Score Value

Summary of Scale Survey Responses with Assigned Scaled Score Value

Survey Question Responses		Scaled Value
<hr/>		
# 1	Always	2
	Occasionally	1
	Never	0
#2	Yes	1
	No	0
#3	Yes	1
	No	0
#4	Always	0
	Occasionally	1
	Never	2
#5	Strongly Agree	3
	Agree	2
	Disagree	1
	Strongly Disagree	0
#6	Yes	1
	No	0

#10	Yes	1
	No	0
#12	Yes	1
	No	0
