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2010 IPFW SUMMER INSTRUCTIONAL DEVELOPMENT GRANT
FINAL REPORT

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Teaching Assistive Technology: An Investigation of the Impact of New Assistive Technology

Course Content on Student Learning

Jeong-il Cho

Professional Studies, IPFW

Introduction

In summer 2010, the project "Teaching Assistive Technology (AT)" was granted the

CELT Summer Instructional Development Grant to enhance the effectiveness of the existing

dual-level course (EDUC K525 Survey of Mild Handicaps and EDUC K370 Introduction to

Learning Disabilities) through (1) the introduction of new course content (various assistive

technology devices and available local services) and (2) collaboration with the federally-funded

assistive technology (AT) project, PATINS Project. EDUC K370/K525 is an introductory-level

special education course. The target student population is students (current and future teachers)

in special education, elementary/secondary education, counseling psychology, and sociology

programs at IPFW. The impact of the new course content on student learning of basic knowledge

and attitude toward AT devices and related local services were measured. Multiple measures

were used: AT surveys, AT observation reports, AT definitions, an AT resource portfolio, and

exams on AT.

Statement of the Problem

Despite the recognized benefits of utilizing assistive technology (AT) devices to increase

students' ability to more effectively participate in daily living and school activities and the

federal mandates which require the use of AT devices in educating students with disabilities, AT

devices are not effectively used in classrooms due to a lack of knowledge, understanding, experience, and federal mandates related to AT devices among teachers and school administrators (Dungan, Campbell, & Wilcox, 2006). AT devices (e.g., software, hardware, and other adapted devices) allow students with disabilities access to the general education curriculum and environment by allowing them to (1) more effectively communicate with their typically developing peers, (2) participate in classroom activities, and (3) benefit from modified instructional materials and techniques (Edyburn, 2003).

Recent federal laws require that students with disabilities have access to assistive technology devices and related services they need. P.L. 108-446 Individuals with Disabilities Education Act (IDEA) of 2004 and H.R. 4278 Improving Access to Assistive Technology for Individuals with Disabilities Act of 2004 acknowledge AT as a critical instructional and learning tool to meet the needs of students with disabilities. In particular, H.R. 4278 of 2004 extended the funding of the 50 states and six territories to establish AT centers, facilities, services, and programs, to develop protection and advocacy services, and to establish federal and state programs.

In a simple AT survey using two questions (What do you know about assistive technology? and What do you want to know about assistive technology?) conducted in EDUC K525/K370 on March 2, 2010, most students, including current teachers, indicated that they want to learn more about a variety of AT devices and that they are unaware of the federally funded AT project. In Indiana, the Promoting Achievement through Technology and INstruction for all Students (PATINS) Project is a federally funded AT program. The PATINS Project is an Indiana Department of Education/Division of Student Learning/Office of Differentiated Learners assistive technology systems change initiative. The project is designed to provide AT devices

and related services to students with disabilities and their teachers at the local Indiana schools. The PATINS project has five lending libraries across Indiana. It offers workshops, trainings, and technical assistance for local school personnel and students with disabilities.

Low-tech items were dominantly reported by teachers as frequently used and accessible items (Whal, 2004). The special education law, IDEA 2004, adopted from H.R. 4278, defines AT as:

> "Any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability. The term does not include a medical device that is surgically implanted or the replacement of such device (20 U.S.C., 1401, Section 602[1])."

AT devices can be "low-tech," such as special paper, velcro-attached pencils, picture communication boards, and erasable highlighters, "mid-tech," such as talking calculators, tape recorders, and overhead projectors, or "high-tech," such as computer synthesized speech devices, voice-recognition software, and adapted power wheelchairs.

Significance of the Project

Although AT has been historically viewed as beneficial to students with disabilities, the increased focus on AT for students with disabilities is a recent trend. Federal and state regulations requiring the use of AT and related services are still new to many teachers. With increased placement of students with disabilities in general education schools and general education classrooms, teaching AT devices and related services to our students majoring in education (future general education and special education teachers) is more critical than ever to provide appropriate academic supports for students with mild disabilities. According to U.S.

Department of Education (2008), approximately 5,912,586 students ages six through twenty-one

nationwide receive special education services. Among them, 4,628, 320 students (about 78% of

students receiving special education services) are identified as having mild disabilities (learning

disabilities, mental retardation, behavioral disorders, and speech or language impairments).

The significance of the current project is found in its focus on training students to gain

basic knowledge and understanding of AT devices and related services for their future or current

students with mild disabilities (learning disabilities, mild mental retardation, behavioral

disorders, speech or language impairments) who experience significant difficulties in academic

tasks and daily activities at school. Second, the current project will raise students' awareness of

recent AT related legal mandates including the Individuals with Disabilities Education Act

(IDEA) of 2004 and the Improving Access to Assistive Technology for Individuals with

Disabilities Act of 2004. With knowledge and understanding of the current legal requirements

related to assistive technology and related services, students would be proactive and effective

teachers, advocates, and leaders in meeting the unique needs of students with mild disabilities.

Third, the current project will also assist teachers to monitor changes in their comfort level and

willingness in using AT in their future and current classrooms through observation assignments,

surveys, in-class activities, exams, and reflection papers.

Lastly, staff development topics suggested by students (current and future teachers)

would be used as valuable information for future content changes in special education courses at

IPFW and training opportunities at the federally funded project, the PATINS Project. The

PATINS Project continually seeks training suggestions from local teachers and related school

professionals in order to ensure that teachers and related professionals know how to operate

various AT devices and are able to take advantage of free training opportunities, as well as to

ensure that students with disabilities have access to AT devices in order to enhance their learning and daily activities at school and home.

This proposed research intends to measure the impact of new course content on student (current and future teachers) learning of basic knowledge of and attitude toward AT and related services which are reported to be beneficial for P-12 students with mild disabilities. The current study is an investigation in which the following three questions are asked:

1. What do students know about assistive technology devices and related services for students with disabilities?

2. What are students' willingness and comfort levels in using assistive technology devices and related services for students with disabilities?

3. How are students' understanding and knowledge of assistive technology devices and related services for students with disabilities changed through university course activities and requirements?

Method

Participants and Setting

Table 1 provides demographic information of participants in the current investigation. Participants include four undergraduate students majoring in elementary education (enrolled in EDUC K370) and 11 graduate students who were previous teachers (enrolled in EDUC K525); two in a certificate only program, seven in a masters' program with certificate, and one enrolled for a continuing education credit. Participation in the current study was voluntary and all participants indicated their willingness to participate in the study.

EDUC K525 Survey of Mild Handicaps is an introductory-level special education course

for graduate students. EDUC K525 has been cross-listed with an undergraduate course, *EDUC*

K370 Introduction to Learning Disabilities. Both courses are designed to provide in-depth

Table 1.

Demographic Characteristics of Participants

			Participants (N=14)
Gender	Male		2
	Female		12
Age	20-29		6
	30-39		5
	40-49		2
	50-59		1
Ethnicity	African American		1
	Caucasian		13
Student Type	Full time student		7
	Part Time student		2
	Others		5
Education Degree	BA/BS		7
	MS/MA		2
	None		5
School Type	Kindergarten		2
	Elementary		4
	Middle		0
	High		1
	Others		7
Current Position	Special Education Teacher		1
	General Education Teacher		4
	Others		8
Years of Teaching	Special Education	None	9
		1-2 year	2
		3-4 year	1
		5-6 year	0
		7-8 year	1
		9 or more	1
	General Education	None	6
		1-2 year	1
		3-4 year	4
		5-6 year	0
		7-8 year	1
		9 or more	1

provide in-depth information about historical development and current status of definitions, classifications, assessment, and instructional strategies for students with mild disabilities (e.g., learning disabilities, attention deficit hyperactivity disorder, behavioral disorders, and mental retardation). Students in special education and elementary/secondary majors find this course very helpful as this course covers fundamental, essential information both general and special education teachers should know in order to work with students with disabilities. Often this is the only special education course that students in non-education majors (e.g., sociology, counseling psychology) take.

EDUC K525/K370 is offered every spring and fall semester and is also offered in summer when enrollment warrants. The target population is students majoring in special education as well as those in elementary and secondary majors whom have selected special education as their concentration area or are interested in learning about special education and related services. The number of students who are affected is approximately 15 to 20 graduate students in EDUC K525 each year along with 15 to 20 undergraduate students in EDUC K370. I have been the only instructor for this dual-level course (EDUC K525 & EDUC K370) in both the spring and fall semesters.

Materials and Procedures

There are three ways to achieve learning outcomes and assess students' understanding and knowledge of AT and related services: new course content, four course requirements, and assistive technology surveys.

New Course Content. Throughout the semester, content were added to previously developed lectures including basic information about empirically proven AT devices for students with mild disabilities, related services including the PATINS Project, and AT related legal

mandates including AT requirements in Individualized Education Plans. AT devices were checked out from the Northeast PATINS Project office in order to provide students hands-on experience with AT devices. Several free demonstration CDs were obtained from various AT companies, and one adapted keyboard and two adapted mouses were purchased with the faculty development funding received by Dr. Phyllis Agness (Special Education). A list of AT devices available on campus was developed and distributed to students in order to expose them to various AT items. In addition, the director of the Northeast (NE) PATINS project gave a guest lecture through *Second Life*, a free 3D virtual world website. The NE PATINS Project has provided most of their AT trainings and workshops through *Second Life*.

Course Requirements. Three types of course requirements were required to assist students to obtain better knowledge and understanding of AT devices and related services: three new assignments (AT observation report and AT resource portfolio); an in-class activity (development of one's own AT definition); and two exams. These new or revised requirements served as assessment tools to measure the impact of new AT course content on student learning.

The AT observation report was collected one time at the beginning of the semester. For this assignment, students visited a P-12 classroom which included students with disabilities and reported on AT devices used in that classroom. In the report, students presented their knowledge and skills, and evaluated their comfort level in utilizing observed devices in their own current and future classrooms. For *the AT Resource Portfolio*, students provided (1) characteristics of each condition, (2) descriptions of usages and features of the selected AT device, (3) visual images (e.g., pictures) of the AT device if available and applicable, (4) information about obtaining the AT device, a price, and availability of a free software demo, (5) descriptions of strengths and weaknesses of the AT device, (6) recommended uses of the AT device, (7) a

training log (date, start/end time, and how long it takes for you to become familiar with the device), and (8) a summary/critique of at least one journal article about the selected AT device. A grading rubric was provided so that students knew how their portfolio was evaluated (new AT objective). In *an in-class AT definition activity and two exams*, students developed their own AT definition three times throughout the semester and demonstrated their understanding of AT related laws. The purpose of having the students develop their own AT definitions on three different occasions is to record changes in their understanding and knowledge of AT devices available for students with disabilities as a result of their exposure to new course activities and requirements.

Assistive Technology Survey. A previously used Assistive Technology Survey (Whal, 2004) was used to examine students' knowledge and understanding of Assistive Technology devices. I was granted permission to use the Assistive Technology survey which was used to investigate Assistive Technology awareness, uses, and training among special education staff. Students completed the same survey two times in class (at the beginning and toward the end of the semester). The results of the first survey (pre-test) and the second survey (post-test) were compared to investigate the impact of new Assistive Technology course content on student learning. The AT Survey included 35 AT items and another 12 questions regarding current use and knowledge of AT devices and the federally funded AT program, PATINS Project.

Project Timeline. In early June 2010, I studied the catalog of 845 AT items owned by the Northeast PATINS Project, selected the AT devices I wanted to explore over the summer, gathered background information about the selected AT devices, and created a timeline to explore each selected device. After developing a tentative timeline, I shared it and a list of the selected AT devices with Daniel McNulty, site coordinator, and his regional site assistant, Vicky

Carlin, at the Northeast PATINS Project to inform them of my visits to the center. I made five full-day visits to the PATINS Project office in Columbia City, Indiana starting from the third week of June and continuing through mid-July. Based on these visits, I compiled a list of AT devices (e.g., Kurzweil 3000, Intellikeys keyboard, TextHelp, Classroom Suite, Jaws) that were available in the Curriculum Lab in the School of Education, IPFW student computing labs, or through free demonstration CDs I ordered over summer 2010.

Since mid-July 2010, I have focused on class preparation, including identification of empirical research articles which contain information about AT related laws and AT devices identified as beneficial to students with disabilities. I completed the course syllabus, prepared lecture notes on AT related laws and the use of a variety of AT devices in P-12 classrooms, and created guidelines/grading rubrics for newly added AT related assignments (e.g., AT Observation Paper and AT Resource Portfolio) and two exams.

As part of my preparation for submitting the IRB application, I revised the previously used Assistive Technology Survey (Whal, 2004) to pilot it during Fall 2010. The revised Assistive Technology Survey designed for the purpose of this study was used to examine students' knowledge and understanding of AT devices. I was granted permission to use the Assistive Technology survey that was used to investigate AT awareness, uses, and training among special education staff. All 14 participants completed the survey two times as pre- and post-test. The results of the first survey (pre-test) and the second, end of semester survey (post-test) were compared to investigate the impact of new AT course contents on student learning.

Results

Analysis of the Assistive Technology Survey: Pre- and Post-Survey Comparison

In a pre-test, most students reported topics of AT training they would be interested in attending; one student expressed no interest in learning AT. These recommended topics were mostly software assisted reading, writing, spoken language, and mathematics (e.g., word predictor software, math software, voice recognition software, Intellitalk: word processor supporting writing and communication skill, scan and read software), and electronic devices (e.g., Alpha Smart, Smart Board, braille translator, iPad). When students were asked about their knowledge of the federally funded AT project in Indiana, the PATINS Project, none of them, including current teachers, recognized the project and had not previously participated in any services provided by the PATINS Project. In a post AT survey conducted during the last class, students expressed a better awareness and understanding of AT devices and the PATINS Project. Most students stated their interest in learning more about software supported reading, writing, and spoken language and SMART Board. Among them, one student expressed an interested in having "a training in what is available in school." This statement made me curious about AT devices utilized in local schools for students with disabilities. The use of AT devices for students with disabilities is a legal mandate. It was noted that at the end of the semester, all students knew essential information about the PATINS Project, such as free loaning services, on-line and in-person AT trainings, Indiana's federally funded AT project, and the location of the center, Wabash.

Analysis of Assistive Technology Observation Experience

With the purpose of learning students' knowledge and comfort level with AT devices and related local resources and services, the following four questions were asked: (1) What kinds of

AT devices (e.g., software, hardware, and other adapted assistive technology devices) were available in the classroom and used by students with mild disabilities?; (2) Were the AT devices appropriate for students?; (3) Have you used those AT devices before?; (4) How comfortable are you in utilizing such devices in your current or future classroom?; and (5) Would you feel comfortable using a variety of AT devices in your own teaching?

Students observed a wide range of AT devices in general education classrooms including SMART Board, books on tape, highlighters tape, recorder, headphones, computer, projection screen, document camera, eyeglasses, pencil grip, tablet computer, software, manipulative kits, post-it notes, enlarged prints, laptop, promethean board, and calculator. All these AT devices are generally available in local schools. The observed devices are categorized as low-tech devices (highlighters tape, eyeglasses, pencil grip, post-it notes, enlarged prints, manipulative kits), mid-tech devices (books on tape, recorder, headphones, projection screen, document camera), or high-tech devices (software, computers, tablet computer). Students reported that these devices seemed to be appropriate for students with disabilities and they had previously used most of these devices. Most students (n=11) indicated that they felt comfortable with using AT devices they observed in general education classrooms. The majority of students (n=11) stated that they need more training with various AT devices in order for them feel more comfortable using them in their current and future classrooms. This result emphasizes the need and importance of AT training for current and future teachers to better serve their students with disabilities who can benefit from using AT devices in learning and daily life. Student responses are found in Appendix 1.

Analysis of Assistive Technology Definitions

Students were asked to develop their own definition of AT based on their understanding and experiences with AT devices. Responses (students' own definitions of AT) were classified in two categories: learning only and daily living and learning (See Table 2). Student responses are found in Appendix 2. For the 1st AT definition at the beginning of the semester, 13 students reported that AT devices are for learning academic content, while one participant indicated that AT devices are not only for learning, but also for daily life of individuals with disabilities. When students were asked the definition of AT for the second time, while nine of them indicated that AT is for learning, five students reported that AT is for both learning and daily living. For the 3rd definition of AT solicited at the end of the semester, all students reported AT as devices for learning, daily living, and more. Students recognized that AT is not only beneficial for academic learning of students with disabilities, but also for other aspects of their daily living.

Table 2.

Assistive Technology Definitions

Purpose of AT devices	1st AT Definition (frequency) (N=14)	2nd AT Definition (frequency) (N=14)	3rd AT Definition (frequency) (N=12)
Learning	13	9	0
Learning and Daily Living	1	5	12

Analysis of Assistive Technology Resource Portfolio

The AT devices students explored are presented in Table 3. Students reported on various AT devices including currently used AT devices in many local schools and other devices not owned by local schools, but widely recognized as assisting students with learning difficulties. Regardless of the devices students chose for their portfolio, most of them acknowledged not only numerous strengths of AT devices for the learning and daily living of students with disabilities, but also two critical issues with using AT devices: (1) the need for training of students with disabilities, their teachers, and parents, and (2) funding to purchase appropriate AT devices and related services. When these issues arose during portfolio presentations, students were reminded of a resource available in Indiana, the PATINS Project which provides training for school personnel and students with disabilities and has four lending libraries across Indiana that loan AT devices to P-12 schools at no cost. Other vital issues were also identified, such as effective uses Table 3.

Assistive Technology Devices for Spoken Language, Reading, Written Language, or Mathematics

Category	Devices
Spoken Language	Communication Device (7-level Communication Builder), Rosetta Stone
Reading	Software (Kurzweil 3000, TextHelp, ReadOutLoud, Intellitools Classroom Suite, Inspiration, Kidsperation, SuccessMaker), iPad
Written Language	SmartBoard, Franklin Speller, Software (Inspiration, Kidsperation, TextHelp)
Mathematics	iPad, Software (Intellitools Classroom Suite, SuccessMaker), Compass Odyssey,

of devices at home, constant monitoring of student on-task behaviors with certain AT devices connected to the internet, and handling of devices due to the fragile nature of electronic devices. Discussions on these issues were enlightening and provided all students an opportunity to critically think about the skills and logistics involved in the effective and successful use of AT devices in their current and future classrooms. A sample student AT portfolio is found in Appendix 3.

Analysis of Exams on Assistive Technology Related Laws

In Exam 1, students were asked two questions that are related to an AT definition and AT related laws and are the fundamental information students should be aware of in order to provide appropriate AT services to meet the needs of students with disabilities. One AT question was in a multiple choice format. Thirteen (n=13) out of 14 students chose a correct answer. The second AT question was in a matching question format. Seven (n=7) students selected a correct answer for this question. In Exam 2, the second question on Exam 1 was asked again, since many students missed this matching question. All students (N=13) chose a correct answer this time. AT related law questions in Exam 1 and 2 were as follows:

Multiple Choice Question:
Which of the following laws extends the funding of the 50 states and six territories to establish assistive technology centers, facilities, services, and programs; to develop protection and advocacy services; and to establish federal and state programs?

1. P.L. 108-446: Individuals with Disabilities Education Act, 2004
2. P.L. 105-394: Assistive Technology Act, 1998
3. P.L. 100-107: Technology related Assistance for Individuals with Disabilities Act, 1988 (Answer)
4. P.L. 93-112: Section 504, The Rehabilitation Act, 1973

Matching Question:
(This law) Provided federal funds to states and territories to establish assistive technology centers, facilities, services, and programs?
(Answer: P.L. 105-394, Assistive Technology Act, 1998)

Conclusions

Through course lectures, discussions, and requirements, students gained fundamental knowledge and understanding of AT devices and available local services (PATINS Project) for their future or current students with disabilities. In addition, students are now aware of AT related legal mandates that require the use of AT devices for students with disabilities and fund a local AT program providing free services for students with disabilities and individuals working with them. With knowledge and understanding of the current legal requirements related to assistive technology and related services, students can be proactive and effective teachers, advocates, and leaders in meeting the unique needs of students with mild disabilities. The current project assisted teachers to examine their comfort level and willingness in using AT in their future and current classrooms through observation assignments, surveys, in-class activities, exams, and reflection papers. As students attempted to use new AT devices and experience on-line AT training via *Second Life*, they experienced a high level of frustration and realized the need of training for both students and teachers.

Training topics on AT suggested by students (current and future teachers) were valuable information for the future course content changes in EDUC K370 and K525. Because our students work mostly with students with mild disabilities, they wanted to know more about learning software and SMART Board which are available in many local schools. AT content in EDUC K370 and K525 will focus more on these suggested devices while I help students become aware of the broad definition of AT. I plan to share these topics with the federally funded PATINS Project, since they continually seek training suggestions from local teachers and related school professionals in order to ensure that teachers and related professionals know how to operate various AT devices and take advantage of free training opportunities, as well as to ensure

that students with disabilities have access to AT devices in order to enhance their learning and daily activities at school and home.

Future Direction

I plan to continue the data collection in EDUC K370 and K525 in order to investigate student knowledge, comfort level, and experience with new AT devices while soliciting their suggestions for better training for current and future special education and general education teachers on AT and related services. Over the winter break, I plan to submit the IRB revision form in order to obtain an IRB approval for a modified version of the current study.

The first modification would be on an AT survey. The modified AT survey will only include items focusing on AT devices for different learning conditions (Spoken Language Difficulties, Reading Difficulties, Written Language, or Mathematic Difficulties) which were frequent problems among students with disabilities. A new observation assignment will be added as a course requirement. Currently, students are required to observe a regular education classroom once at the beginning of the semester in order to identify AT devices and acknowledge their knowledge and comfort level with using observed devices. During the mid-term evaluation meeting organized by CELT, it was recommended that students provide a description of each device as a way to ensure their understanding and knowledge of each device, rather than simply soliciting a response as to whether or not students are familiar with the device.

The second modification is related to the existing observation assignment. The revised IRB will propose that students will perform two observations of the same regular education classroom (at the beginning and toward the end of the semester) in order to compare their findings and report changes in their knowledge and comfort level in using various AT devices. The class had an "unintended" extensive and stimulating discussion about AT devices before and

after their observations. This extensive conversation started with questions by several students who wanted to make sure that they identified "correct" AT devices in their observation report. During the discussion following the submission of their observation papers, all students were actively engaged and shared their experiences with AT devices they observed. Many students expressed that they had never thought of certain and routinely used devices (low-tech devices) as AT devices. Providing a template for their observation paper was a good idea, as it guided them to report their observation, evaluation, and reflection on various AT devices used in a general education classroom. Even though it was not on a course syllabus, I considered providing students an opportunity for a second observation of the same classroom as an extra credit activity. The second observation would provide an opportunity to compare the identified AT devices *before and after* their exposure to AT devices through lectures and discussions. I plan to require a second observation of the same classroom in future classes.

The third modification to the existing IRB is related to one course requirement (training participation report) which is a required course assignment, but not a part of the approved IRB application. In the revised IRB application, I will seek IRB approval for the use of the student training report collected in Fall 2010 and will also request an approval for the use of the training report in the future. Participation in AT training offered by a federally funded AT program, PATINS Project, in Indiana and a two-page summary is one of the current course requirements and will continue to be required in order to get a glimpse of the "technology" experiences students have when they attend workshops and trainings through a new training medium (*Second Life*, a free 3D virtual world website) used by the federally funded AT program. During the presentation of the PATINS Project training report, the class was engaged in active discussion in various topics including the benefit of on-line training (*Second Life*) versus in-person training.

There were divided opinions regarding these two delivery formats, as both formats have pros and

cons in terms of convenience, productivity, and quality of interactions.

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Appendix 1

AT Observation Paper

(1) What kinds of assistive technology devices (e.g., software, hardware, and other adapted assistive technology devices) were available in the classroom and used by students with mild disabilities?

Student	Student Response	Observed AT Devices Reported
Student 1	During my observation I only noticed a few items that would be considered as assistive technology in the classroom, the smart board and books on tape. During my observation those items were not used at all, but when I asked the teacher about them she said yes the students with disabilities get to use those devices just as nay of the other students would use them.	• Smart Board • Books on tape
Student 2	I did not see the girls with learning disabilities using any devices. I saw many devices in the classroom that they may have used including highlighters, tape recorders, and listening center with headphones. The student with VI had many devices available to accommodate his needs. All of his textbooks were printed in enlarged print through IREC (Indiana Educational Resource Center), there was a document camera which projects any document onto the projection screen or onto a computer monitor (there was one the teacher uses and another that he can use anytime he needs on his own, the computer, there are 6 in the room but one is equipped with a device that allows him to zoom in on anything and adjust the contract so he can see it. I also noted that there were calculators, but I did not see how they were used.	• Highlighters • Tape recorder • Headphones • Projection screen • Enlarged prints • Computer • Document camera • Calculators
Student 3	I did not notice any special assistive technology in the general education classrooms. The only device that I notice in all of the classrooms was a SMART board. Each classroom utilized this technology for delivery of the lessons by the general education teacher. All students were included in the using of the SMART boards. I observed the general education teacher making no preference for which students to come to the smart board and share their work via this device.	• Smart board
Student 4	I did not observe any assistive technology being used with the student in the classroom. I did not notice any assistive technology in the classroom that the student could potentially use.	None
Student 5	The child I observed did not require the use of any assistive technology. I did not see any out in the room. When I asked the	None

	teacher, she said there is no need for it at the present time.	
Student 6	There were no assistive technology devices available for any of the students in any of the classes that I observed. It is my understanding that the school does have some Alpha Smart devices available to those who qualify, but I did not see any student using one. The school does subscribe to Compass Learning for credit recovery and supplemental help. I observed one student in the computer lab who was working on this program but could not speak with him. He was taking a timed test and the class I was following was moving to another area. This program is available for help in English, biology, and algebra.	None
Student 7	In the classroom there were five computers, a projection screen, projector, and document camera. The computers were in being used during my observation time. The projection screen, projector, and document camera were used in order for students to follow along in reading and to see documents. The teacher had an overhead machine in her classroom and is still getting use to the document camera. The students with disabilities did not have any individual AT devices.	• Computers • Projection Screen • Overhead projector • Document Camera
Student 8	The assistive technology I saw used in the class was eyeglasses and pencil grips. A power point presentation was used to give students a visual guide to reading vocabulary.	• Eyeglasses • Pencil grip • Computer • Projection screen
Student 9	During classroom instruction, teachers at the school have tablet computers and LCD projectors available. With the ability to have the same math workbook page on the screen as the students have on their desks, the teacher is able to demonstrate the steps to solving the problem while walking around the room to monitor the students' work. Although the tablet/projector system could be considered instructional technology rather than assistive technology, some teachers allow students to work out math problems or daily language corrections in front of the class on the tablet. The tablet can be held like a notebook or put on the desk, and the stylist pen is the size of a regular pen. Students who would struggle writing on the vertical chalkboard or whiteboard benefit from being able to write with the more natural tablet and stylist. Student computers with internet access are also available for various purposes including remedial practice. One such remedial program is Waterford Early Reading Program. This program is currently available throughout the school as we are waiting on a patch from the manufacturer so the program will work on our computers that were recently upgraded to Windows 7.	• Tablet computer • LCD projector • Stylist pen • Computer • Software • Manipulative kits • Post-it notes

	There are also materials located in the classroom that are available for students to use. A cart in the classroom where I observed is loaded with math manipulative kits that the students were reminded are available. These kits include play money coins, counting blocks, plastic clocks, base ten rods, fraction files, and a ruler. There are also post-it notes available for students to record notes in the books they are readings.	
Student 10	The assistive technological devices available in the Biology classroom were a document camera for "Bellwork" and a Power Point displayed through a projector during lecture/note-taking. The Biology teacher also displayed the weekly vocabulary words in large print on a bulletin board. The English teacher used Power Point slides through the projector and the document camera when completing the worksheets in class. A computer program called Compass Learning was used to complete the math assessment during Algebra.	• Document camera • Powerpoint • Large print • Computer • Software
Student 11	One assistive technology device used in the classroom to support the needs of the students with learning disabilities was a SMART Board. SMART boards are interactive touch screen whiteboards that display images from the computer monitor. The SMART board can be controlled from the board itself by touching the screen with your finger or with one of the incorporated electronic pens. The SMART board presents information in an interactive manner with features such as sound, animation, and video recordings. Another device used was TextAloud, computer software that reads to students. During the reading lesson, the students with learning disabilities went to the listening station and listened to the computer read the chapter aloud through headphones. Other than these assistive technology devices, I did not see any others because the disabilities of the students were not very severe and did not need any other special accommodations.	• SMART board • Computer • Headphones • Software
Student 12	Every student has a laptop. They have access to all the technology they need. The school uses SMART board, Promethean boards, GoogleDocs. The school is pushing the envelope with technology. They use document cameras, Inspiration 8, and digital graphic organizers.	• Laptop • SMART board • Promethean board • Document camera • Software
Student 13	In the classroom, there were computers that the students could use for activities; these could be used by all students in the room. The teacher was also fortunate enough to have a SMART board in her room to use for teaching her lessons. There was also a document camera the teacher was not using it but she did have it in her classroom. As I was leaving the observation there was another teacher in the hall with a student using a hand held	• Computer • SMART board

	device to evaluate the students reading.	
Student 14	There were no assistive technology devices in the classroom in which I observed. I spoke with the head of the technology department and she told me there were two programs available for students who had difficulty reading and writing. These programs were installed on computers in the resource room. The programs were a writing program, "Co-Writer," and a reading program, "Reading Out Loud."	None

(2) Were the AT devices appropriate for students?

Student	Student Response	Appropriateness of Observed Devices
Student 1	The books on tape are appropriate for students. I would consider the SMART board would need to be monitored more by the teacher. When students use the SMART board the teacher explained to me that she is usually right there assisting the students, especially those students with disabilities.	Appropriate
Student 2	Yes, the technology was helpful to the student and the teacher expressed her concern for the student when he moves to middle school next year where these devices may not be available. She told me that his document camera was his to use any time throughout the day whenever he needed to. I have learned in classes through that often students who need special devices choose not to use them frequently because they don't want to be different.	Appropriate
Student 3	The AT devices were appropriate for all the students. I observed that none of the students in 1st, 2nd, or 3rd period had any difficulties using the technology nor were any students intimidated by the many functions that it offered. I also noticed that all of the students could not wait to get up to the board to show off their work. The special education teacher did not have to offer any additional prompts to motivate a student with a mild disability to go to the board to participate.	Appropriate
Student 4	There were not AT devices that were being used by the student.	None
Student 5	I did not see any assistive technology available.	None
Student 6	Again, I did not see any devices being used by asked the special education teachers I observed about them. All agreed that the AT devices they had available for the students were easy for the students who needed them to use. I was told that using an Alpha Smart was much like using a computer.	None
Student 7	Yes, I think they were appropriate for the students. Each student has problems with reading, so being able to see the documents clearly and having the teacher point out the words was appropriate. The teacher stood off to the side of the screen so the students could see and did not have to look around her to see the screen. I did not observe the students on the computer, but I am sure they are used appropriately for the students with disabilities.	Appropriate
Student 8	They were appropriate AT devices for the students. The student who had difficulty gripping as pencil needed a pencil grip to assist with writing his assignments. The student with	Appropriate

	glasses needed to see to learn. The power point presentation assisted all students who tend to be more visual learners than auditory learners.	
Student 9	These devices appeared to be appropriate for the students. Only a few students used a math manipulative kit, and those students found the appropriate manipulative for given math problems. Because the internet math activity website is set to the level of the student and the Waterford reading software uses a placement test, the students are doing work that is appropriate for the skills being taught and their level of development with that skill.	Appropriate
Student 10	The AT devices seemed to draw and keep the attention of the students. The student specifically being observed especially benefitted from the technology used as it allowed for him to keep up with his peers more easily by having a very precise visual to focus on and follow. This student seemed to lose his place without the worksheet being completed underneath the document camera. The Power Point slides made the notes easy to follow for those students who have problems seeing the board or focusing in general. The computer program, Compass Learning, especially with the headphones being used helped prevent distractions.	Appropriate
Student 11	Yes, I believe that the AT devices used were appropriate for the students with learning disabilities. Conducting a lesson with a SMART board keeps the students engaged in learning. Students with disabilities in this general education classroom have trouble staying focused and thus, using a SMART board is beneficial because it keeps the students' interest longer than using an old textbook. Furthermore, the SMART board is an example of technology being put to good use because it reaches students at different levels of learning. Having objects being moved around on the whiteboard and having colorful visuals keep a student's attention much longer is much more beneficial than a lesson without a SMART board. Additionally, I would also agree that having the TextAloud software is beneficial for the students with learning disabilities. This software allows the students to visually see the words and physically hear the words which foster their needs to fully comprehend what they are reading. Ultimately, the SMART board and the TextAloud support the needs of the students with learning disabilities so they can perform in the classroom at their fullest potential.	Appropriate
Student 12	Yes, the AT devices were appropriate. They had been given appropriate instruction o how to use the devices. They use them on a daily basis. Our society has become so saturated with computers that the students tend to be more use friendly	Appropriate

	with the devices than the teachers.	
Student 13	All of these AT devices were appropriate for the students. They could be used by all students and there would be no problems with them. At this point in our society having computers in the classroom or at least accessible to students is not only appropriate but a necessity. The SMART board is a great tool for students to engage in their learning whether they have a disability or not.	Appropriate
Student 14	My student did not use the assistive technology. However, I believe he could have benefited from a pencil grip for handwriting. I also believe program such as Co-Writer and Read Out Loud would have been very helpful in facilitating his reading and writing skills.	None

(3) Have you used those AT devices before?

Student	Student Response	Previous Experiences with Observed Devices
Student 1	Yes, I have used both books on tape and a smart board before. I'm not a teacher myself but during my internship I was able to use those devices in the classroom. In my internship I didn't have any students with disabilities so I never experienced using those devices with a child who has a disability.	Yes
Student 2	I have used enlarged print books. I have used them myself because I have poor vision. I have not used any of the document cameras. They appeared to be very simple to use. I imagine that the other students in the class benefit from learning about the devices too. Maybe some of them may be interested in assistive technology in the future because of their exposure and firsthand knowledge of how it helps people.	Yes and No
Student 3	Yes, I have used this assistive technology before when I was teaching and I also found that most students whether general education or special education were not intimidated by the new technology. Most of the students would want to take a chance at learning, how to use it. I found that to be very interesting as most people are afraid of something that they are not familiar with.	Yes
Student 4	There were no AT devices that were being used. I cannot recall using many AT devices wit my students in the past.	NA
Student 5	I did not see any assistive technology available.	NA
Student 6	I have not used an Alpha Smart or the Compass Learning program. Neither of these devices/programs was available for me to sue while I was at the school. I did have the chance to observe a student using the Compass Learning program and the student was navigated his way throughout the program with ease.	No
Student 7	I have used the devices before. In my classroom, we just got a projector and a document camera. I use it a lot with my students. I think they like looking at things in a new way., It allows me to show them different types of technologies they can use to learn. We have not gotten on the computers very much because I am trying to make sure we use them properly. I love suing the document camera. It allows for students to stay focused and they can follow along as I read to them or walk through their weekly ISTEP + test.	Yes
Student 8	I have used all of these items in my teaching. I also have used triangle shaped pencils and crayons to help strengthen pencil grips. I use power point presentation with my class at Ivy Tech to give a visual learning aid.	Yes
Student 9	My student teaching and substitute teaching experience were in	Yes

	elementary classrooms that had math manipulatives available for students. I have used these manipulatives to help students visualize and solve a math problem. During a staff in-service and subsequent collaboration meeting, I was introduced to the internet-based website used by the student in this classroom (Internet4classrooms. Com) and also had the opportunity to explore this resource. As a reading intervention teacher, I am very familiar with the Waterford Early Reading Program. I administered the program for a year as a tier two intervention before moving the program into the classrooms last year to be used as a tier one intervention.	
Student 10	Last year, I helped turn on the projector for other teachers, but did not have any experience with using them during a lesson. I did not have any experience with a document camera until this year. I have used Power Point presentations many times in the past. I feel I have lots of potential in using assistive technology; I just need more training and techniques with which to use the technology.	Yes and No
Student 11	Yes, I have used the SMART board device before in the curriculum lab at IPFW and in one of my education classes. I thoroughly have enjoyed working with a SMART board because the device makes learning fun. I was given the opportunity to show a Power Point presentation on the device which was interesting because I had the students interacting with me, the board, and each other. This device is a great way to get students involved using the different learning styles which makes it such a great tool for students with learning disabilities. Additionally, I have also used TextAloud software when I was a student in elementary school. I listened to children's books at the listening center which were read by a narrator. As a look back on the TextAloud device, I think it really helped me develop my reading fluency and word recognition skills. Students who have learning disabilities and struggle with reading are lucky to have the TextAloud device to assist them and develop improved reading skills.	Yes
Student 12	I have never used nay of these devices before. However, I will be working with them on a daily basis in the coming months.	No
Student 13	I have used all of the AT devices before except for the device used to test a student's reading. I really enjoyed the SMART board and am hopeful to have one in my future classroom. I think that the SMART board is a great tool for students to use and really helps them to engage in their own learning.	Yes
Student 14	As a special education professional, I have use Co-Writer before. I have never used Read Out Loud. Co-Writer was a great tool for students who experienced writing difficulties. It gave them confidence in their writing skills and helped them create work	Yes and No

| | that exhibited their writing potential. Co-Writer got rid of the frustration of trying to spell each work correctly, and helped students focus more on the content of their writing. | |

(4) How comfortable are you in utilizing such devices in your current or future classroom?

Student	Student Response	Comfort Level with Observed AT devices
Student 1	I would fee very comfortable utilizing theses devices in a future classroom. I personally feel that I'm up to date on new technology and how those items can be used to help children in the classroom with or without disabilities. Keeping all children engaged in activities takes a lot of thought and consideration on AT devices. Those devices can help switch up a normal routine of just reading a book silently or working at a desk with a worksheet. Using the smart board can be interactive and fun for all students to use and the options available with a smart board are endless.	Very comfortable
Student 2	I feel completely comfortable about learning to use any and all devices that help a student learn. I will consider it my duty to seek out devices to help all my students have the best possible experiences. If my school has few resources I will have to be creative in finding ways to bridge the gap to make it fair for my students. I will have to locate resource lending libraries, or other such organizations. It is part of my job.	Very comfortable
Student 3	I am very comfortable utilizing such devices in my current or future classroom. I have found that the students are not intimidated by technology and if the teacher shows any fear towards anything new or challenging to him or her, students will label that teacher as inadequate or not very smart.	Very comfortable
Student 4	I am not very comfortable with AT devices right now. I have had very little experience with AT devices and would like to become more familiar with different devices that are available to assist students. I have never had a student with a physical disability so I have yet to be exposed to any assistive technology that could be sued for students with severe disabilities. I would really like to be trained in how to use some of those devices.	Not comfortable
Student 5	Although, I did not see any assistive technology on this specific observation I would be open to utilizing devices in my classroom. Of course I would want proper training on how to use the device, prior to using it in the classroom with a student.	Not applicable
Student 6	I believe I would be comfortable with either of the devices once I was able to experiment with them myself. Becoming more familiar with these would allow me to be more relaxed in demonstrating their use to the students and really show them how helpful the device could be to them.	Comfortable
Student 7	I am very comfortable using them. In fact, it is a shame when teachers do not have the most-up-to date technology in the classroom. Currently I use the document camera, projector, and	Very comfortable

	screen in my room at least five times a day. We start off the day using it and then use it for Math, Reading, Writing, and Science.	
Student 8	I am very comfortable using AT. I was using some forms of AT when I taught first grade and didn't really know the term assisted technology. I am excited about learning more about assisted technology and how it can help my students learn.	Very comfortable
Student 9	As one of the school's reading intervention teachers, I am the school administrator for the Waterford Early Reading (and math) program. As the administrator for my building, it is my responsibility to train classroom teachers in the program and also be available for continual program support. I am very comfortable with this role. Last year my school focused staff development in the area of technology. We spent in-service time and collaboration time exploring computer-based programs and internet-based programs to assist our students academically. We were also required to integrate a new form of assistive technology (new to the individual teacher) in our classrooms, evaluate that usage, and report on our information at a staff meeting. I found myself to be very comfortable with the technology I chose as well as the technology other teachers chose.	Very comfortable
Student 10	If I had more training on how to use the wall mount of buttons for the projector in my room, I would use it more. Whenever I try to use it for more than one thing, like trying to show a video off my computer and then using the document camera, I get confused with which button to push and how many times I have to push it; then I end up messing it up so bad that I have to resort to another method of delivering the material. I usually depend on my paraprofessional to assist me in the technology aspect because they know it better than me and have been using it longer than I have.	Not comfortable
Student 11	I would feel very comfortable in utilizing these devices in my future classroom because I am familiar with the devices and have used them before. Since the devices are easy to operate and I don't feel intimidated by them, I feel comfortable about using them in my future classroom. However, I do believe that if I had to work with foreign devices that were complicated and difficult to work then I would feel uncomfortable about using them in my future classroom. In my opinion, it is very important to know how a device operates and how it can be beneficial to students before implanting the device in the classroom.	Very comfortable
Student 12	I am very comfortable. Even if I can't figure out how to use a device on my won, I am not afraid to ask for help. I will encourage that same belief in my classroom.	Very comfortable
Student 13	I would be very comfortable to use all of these devices in my future classroom. I also have the knowledge as to how these	Very comfortable

	devices work.	
Student 14	I am very comfortable using assistive technology software in my classroom. I am also comfortable with other devices such as pencil grips and colored overlays. I believe it is my job as an educator to provide my students with anything that will help their learning. I am also willing to be trained on the use of devices with which I am not familiar.	Very comfortable

(5) Would you feel comfortable using a variety of AT devices in your own teaching?

Student	Student Response training	Comfort Level with a variety of AT devices
Student 1	I would feel comfortable using a variety of AT devices. I would want to know everything about the device before attempting to use it in my own classroom but I would be open to anything. It would especially help to see those devices used in multiple settings with multiple students to have a better handle of how to use the device.	Comfortable
Student 2	Yes. I have no anxiety about learning new devices. I am fascinated by what tools can do and would enjoy watching the student benefit from such a device even if it required a bit of my time to learn to use it effectively. I plan to learn as much as I can about the AT devices from the resources I have been told about in this class already, such as PATINS.	Comfortable
Student 3	I would feel comfortable using a variety of AT devices in my own teaching. I feel that each student will need an AT device or two based on his or her disability. AT devices also make the student with a disability feel comfortable as this device(s) make learning more achievable. I have found that when I use an AT device even as minute as a calculator the student feels that he or she can accomplish what general education students can and this helps in boosting their confidence with abstract subjects such as math and science.	Comfortable
Student 4	At this current time, I do not feel comfortable using AT devices in my own classroom. I do not feel that I have enough information or resources on how to properly use them in my classroom. I do not feel that I would be able to use them correctly. After I receive training on specific AT devices, I am sure that I would feel much more comfortable with using them in my classroom with my students.	Not comfortable
Student 5	I would feel comfortable if I had proper training on how to use the devices. I would be willing to try anything that would benefit the child.	Comfortable
Student 6	Using a variety of AT devices in my own classroom would indeed be something I would be comfortable with. Being able to help a student become successful at a subject that has been causing them problems would make the device all that more valuable. I think that most students today are very technologically savvy and would be excited to work with a device that could help them in an area they are experiencing so much frustration with.	Comfortable
Student 7	As long as I knew how to use them properly, yes. I have been in rooms where AT devices are not used simply because the	Not comfortable

	teacher does not know how to use them. The ones I received in my room are very nice and easy to use. I know when the teacher I am substituting for returns she will need to know how to use them. If she does not learn, she could be one of the teachers that do not use them because she does not know how. The students enjoy using them so it would be sad to see them sitting in the room with dust collecting on them.	
Student 8	I would feel very comfortable using a variety of AT devices in my own teaching. I have used pencil grips, books on tape, adapted paper, written schedules, graphic organizers, and multimedia software. I would like to know what is new and effective to help my students with learning disabilities.	Comfortable
Student 9	I would feel comfortable using a variety of AT devices in my classroom provided I have had a chance to explore the device and know how to use it myself. Currently I use the Waterford Early Reading Program in the reading intervention room with students who need an additional session on the program. I welcome the opportunity to use other sources to help my students succeed. One of my goals in this course is to become more familiar with the AT devices available in my school. As a frequent member of our Building-based Team (or Prereferral Instructional Support Team), it is important for me to have background knowledge on the available devices so that I can make more informed recommendations for use in the general education classroom and/or my reading intervention classroom.	Comfortable
Student 10	I would feel comfortable with using a variety of AT devices if I was trained properly. Improper use or technical difficulties of the devices hinder the learning experience and mess with the time management of a class. I would also need strategies on how to implement these devices into my lessons. Knowing how to use an AT device in my room for the most effective utilization I the lesson would be my goal.	Comfortable
Student 11	I have mixed feelings about using assistive technology devices. For the most part, I feel comfortable using a variety of assistive technology devices because I believe that I am technology savvy. I understand that some devices are complex and complicated which are reasons why I am willing to dedicate my time to attend workshops that explain how to use some of the assistive technology devices in the classroom. I am interested in learning more about assistive technology as a student so that when I teach the teaching profession I will have a great deal of knowledge and understanding of how certain devices work. Since, I have a positive outlook on using assistive technology; I will therefore feel more comfortable using it in my classroom. I will know how the device operates, how to use the device effectively in my classroom, and how to support and encourage	Mixed Feeling

	students who will have to use the device themselves.	
Student 12	I would feel comfortable using a variety of AT devices in my classroom. They allow for a greater level of understanding by students. It allows students to access material that they might not have learned previously. There are so many great applications for technology in the classroom. The wonderful thing is that there will be many great new creations in the future.	Comfortable
Student 13	I would feel comfortable using a variety of AT devices in my classroom as long as I were properly trained. I think AT devices in the classroom are a great resource for students and teachers in education. There are many AT devices out there that are changing students learning and helping to improve it every day. If there is going to be a way out there to assist in making a student learning experience better I would be open to trying it in my classroom.	Comfortable
Student 14	I would feel very comfortable using a variety of AT devices in my teaching. I am always open to learning new and innovative ways to teach. I think AT devices could benefit all students, not just those with disabilities. The SAMRT Board, for instance, is a phenomenal device with limitless possibilities to accommodate all types of learners. I would be excited to receive training about how to use a variety of AT devices. I believe it is generally the fear of not knowing how to use something that prevents us from using it. That is why good training is so important.	Comfortable

Appendix 2

AT Definition

1st AT Definition (N=14)

Student	Definition	Category
Student 1	Any device used to facilitate learning by supporting a student's physical or emotional needs	Learning,
Student 2	Technology provided to schools and students to assist students with disabilities in learning	Learning
Student 3	AT are instruments or devices used by students or teachers to make learning possible despite physical and mental disabilities	Learning
Student 4	Assistive Technology is any object used to assist students while in school or at home with learning.	Learning
Student 5	Assistive technology is any device or devices that enhances, educates, or improves the ability of a student with a recognizable disability.	Learning
Student 6	AT is any device, object, or thing that can be used to help a student in the school setting learn that has a disability. AT can be used for students without disabilities as well.	Learning
Student 7	Assistive technology is any device that helps a student in their academic pursuit of knowledge.	Leaning
Student 8	It is any device that assists students in learning.	Learning
Student 9	AT is a way for students with disabilities to learn. AT helps students by adapting instruction/personal items to fit the individual needs. Some are very personalized while other are for all students in a classroom.	Learning
Student 10	Assistive technology are devices used to help individuals perform tasks at their fullest potential. Examples of AT are computers, enlarge writing, learning aids, etc.	Learning
Student 11	AT is any object or program that can be used to assist a student and enhance their learning process.	Learning
Student 12	AT is any device (handmade, manufactured-made or bought) that assists a student in fulfill their educational needs/requirements/reading their full potential. AT includes pencil grip, software, modified keyboard, communication board, weighted vest, etc. Does not always require a plug.	Learning
Student 13	AT is a device that is used to enhance the learning process and achievement of students with a disability. The device can be used low-tech, no-tech, or high tech.	Learning
Student 14	Assistive technology is any device used by a person with a disability that makes life easier. It could help them complete an assignment or task. It also supports learning.	Daily living Learning

2nd AT Definition (N=14)

Student	Definition	Category
Student 1	A device that is used by a student to aid in learning and/or everyday living that helps him/her function as normally as possible. The device can be low-tech, high-tech, teacher-made and/or store bought. This device may not be surgically implanted.	Learning Daily living
Student 2	Assistive technology is any device or tool used to assist a student to learn despite having a trouble with regular classroom materials. It may be a hand made aid or an expensive manufactured device. It may be high tech or very low tech.	learning
Student 3	It is anything that can be used by an individual to help meet their needs/perform better academically and personally.	Learning Daily living
Student 4	Assistive technology is an object/program used to assist children with learning either at school or at home. This technology should help students, especially those with disabilities with any school work they may have.	learning
Student 5	Assistive technology is any device (hardware, software, commercially-sold, handmade) that assists the learners in learning new materials or reviewing/remediating previously learned materials.	learning
Student 6	Any device made, purchased or borrowed used to help assist a person with disabilities so that they may get the best education possible.	learning
Student 7	Assistive technology is any device that (manufactured, off the shelf) helps an individual perform to his/her maximum potential. It does not include a device that has been surgically implemented or the replacement of that device (IDEA, 2004). From my experience, I have seen many AT devices such as communication boards, SMART boards, READING SOFTWARE (text aloud), programs that can enlarge print, head pieces made to help students write, etc.	Learning Daily living
Student 8	Any devices or program manufactured, off the shelf, or adapted to maintain or enhance a student's ability to learn.	learning
Student 9	My current definition of assistive technology is any device manufactured or hand made that allows a student to participate in general education classes and daily living practices like one of his /her peers.	Learning Daily living
Student 10	Assistive technology is a piece of equipment or device that aids the student during class. It can be purchased off the shelf from a specialized store, home made- it helps the student become successful in his academic pursuits.	learning
Student 11	Devices used in the classroom to assist in students learning and achievement.	learning
Student 12	Assistive technology is a device purchased or create that assist a	learning

	person with a disability to complete a task. Some examples are: computer software, projector, pencil grip, EZ read.	
Student 13	Any object or device that can aid a student or help a student in the reading process.	learning
Student 14	Assistive technology is any device, apparatus, or utensil that is used by a student or adult with a disability to enhance, improve, modify, or aid in the day to day functions of this person's life. The device(s) must be used to restore or improve present or past skills.	Learning Daily living

3rd AT Definition (N=13)

Student	Definition	Category
Student 1	It is anything that can be used ay an individual to help them on a daily basis live a more functional life.	Daily living
Student 2	AT is any device that any person would use for assistance in learning and daily life.	Learning and Daily living
Student 3	A low tech, high tech or medium tech device that can be used to help people perform everyday tasks and academic tasks. This may not be a surgically implanted device.	Learning and Daily living
Student 4	AT is any device that helped a student and person with a disability to improve their schooling and their daily life.	Learning and Daily living
Student 5	Any device that is used to aid in learning or daily living can be a low-tech device or high tech device.	Learning and Daily living
Student 6	Assistive technology is any device that enhances, improves, or creates a learning environment. AT makes the students' life better.	Learning and Daily living
Student 7	AT is any device, either purchased or made that supports students in learning or completing daily skills.	Learning and Daily living
Student 8	Any device that can help a student be more successful within all areas of disability.	Learning and Daily living
Student 9	Any manufactured, modified or handmade device that can assist in learning or daily living to make tasks either more accessible or easier accomplish.	Learning and Daily living
Student 10	Assistive technology is any item that can be bought or made and is used to help a person with disabilities in many different ways.	Learning and Daily living
Student 11	Any device, manufactured or low tech that helps students learn or improve the quality of his/her daily life.	Learning and Daily living
Student 12	Any device that assists learning and daily living.	Learning and Daily living

Appendix 3

Sample Assistive Technology Resource Portfolio

Name of the AT tool: SuccessMaker

Target Population: 2nd – 8th grade; learning disabilities and general education students
(Websites claimed it is for students in K-8, but the resource teacher at my
school could only put in a student as young as 2nd grade. We have another
program available for students in K-2.)

1. **representative characteristics of the learning condition (Spoken Language Difficulties, Reading Difficulties, Written Language, or Mathematic Difficulties)**

SuccessMaker can be used as an intervention tool for students with reading difficulties or mathematic difficulties. For the purpose of this project, I explored it as a tool for mathematic difficulties.

2. **comprehensive descriptions of usages, and features of the selected software applications, hardware, and adapted computer access tools**

SuccessMaker is an internet-based software program, but it must be used on a school-networked computer. It can be used for reading instruction or math instruction, but I only used the math portion of the program. The user begins by taking a placement test, and after this 120 question pre-assessment is completed the user is given practice questions that are based on the student's instructional level and the practice includes visual representations of the problems.

The program can be used for students who are working below grade-level, at grade-level, or even beyond grade-level because the lessons are given at the level determined by the pre-assessment. This product can be used in elementary schools and middle schools.

3. **visual images (e.g., pictures) of the selected AT device if available and applicable**
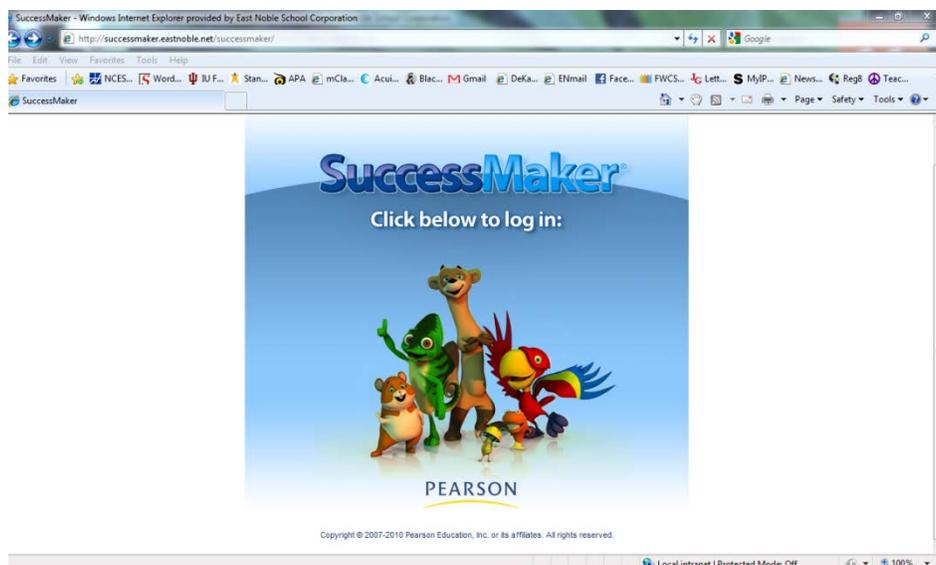
First Screen after clicking on SuccessMaker link on the school website

Example of a pre-assessment question for student in second grade

2. information about obtaining the selected AT device, a price, and availability of a free software demo

There is a free online demo of the program; however the tester must complete a form detailing their job title, school, and purchasing possibilities.

Schools or school districts purchase a package of licenses. Those licenses limit the number of users at any one time but not the number of users. For example, if a school has five licenses, then five users can be on the program at any given moment. When those five users are finished, five more users can take their place. This program would not be purchased by an individual teacher.

3.descriptions of strengths and weaknesses of the selected AT device

Strengths:
+   A child begins the program by taking a placement test with 120 questions. The program will scaffold the questions to determine the instructional level of the student.
+   There is a reference tab for the student to look up key terms in the glossary, facts about different types of currency (nickel, dime, etc.), geometric formulas, conversion charts, symbols, and more.
+   The student can click on a tab to use a ruler, conversion chart, or protractor.
+   If a student is frustrated by a problem, he/she can click to have the answer given and explained.

+ Students can monitor personal progress for the day by clicking the progress tab. This shows the number of questions answered correctly, the number of questions asked, and the percentage of correct responses.
+ The problems are read aloud. The student can click on a line of the problem and it will be read aloud again.
+ Characters appear age-appropriate.
+ If the student answers incorrectly, visuals are given and the answer can be changed.

Weaknesses:
− Many questions seem exactly the same and become tedious. (i.e. 5 cats climb up a tree. Then 2 cats climb down the tree. 2 more cats climb back up. How many cats are in the tree now?)

4. recommended uses of the selected AT device

This can be used as an intervention tool in any of the three tiers of instruction. In our school district it is a web-based program, but it has to be used within a building in the corporation. I would use it as a tier two or tier three intervention tool.

5. a training log (date, start/end time, and how long it takes for you to become familiar with the device)

Date	Start Time	End Time	Amount of time	Activity
11-11-10	3:00	4:30	1:30	Pre-assessment with personal note taking for the purpose of this form
11-15-10	4:10	4:30	0:20	Continue pre-assessment and begin lessons
11-16-10	8:20	8:30	0:10	Review of results and results data sheet with school resource teacher

It took me approximately two hours to become familiar with this program. If I were the administrator of the program, I would need more time to fully understand the reports that are available.

6. a summary/critique of at least one journal article related to the selected AT device.

Shields, C. (2004). PROGRESS REPORT. *District Administration*, *40*(5), 56-58.

This article is a case study on the use of SuccessMaker in a low-income school district.

This district also has a large immigrant population due to its proximity to the US/Mexico border.

According to the article (Shields, 2004), the district showed the following results:

Subject	Program Hours	Results
Math & Science	≥ 15 hours	182% higher scores than users of less than 15 hours
Reading & Language Arts	≥ 14 hours	42% higher scores than users of less than 14 hours.

This article and these results leave me with questions. I wonder how long it took the students to reach the 14 or 15 hours mark. Were students given the opportunity to use the program every day in order to complete the mark in maybe a month, or did it take students months to reach that mark? In my building, students do not use the program daily because of all the other available programs and small-group instruction that takes time in the day. I don't believe that students are on the program for more than a half-hour time session either.

The point of this article was to make the argument that to increase the success of students, we must use the data that we have collected to drive instruction. Collecting data for the sake of data-collection lacks meaning and purpose. Within the SuccessMaker report for math, individual mathematical skills (computation and application) are listed with tested grade-level data and scores from practice sessions. The teacher can see the breakdown of skills and use the data to focus instruction to help the student master a skill, which is referred to as data-driven instruction.