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Evaluation of General and Specific Assistive Technology Knowledge Among Students with Disabilities in Postsecondary Environments

Randall Boen

Southern Illinois University Carbondale, randallboen@siu.edu

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EVALUATION OF GENERAL AND SPECIFIC ASSISTIVE TECHNOLOGY KNOWLEDGE
AMONG STUDENTS WITH DISABILITIES IN POSTSECONDARY ENVIRONMENTS

By

Randall D Boen

B.S., Austin Peay State University, 2010

A Thesis

Submitted in Partial Fulfillment of the Requirements for the
Master of Science, Rehabilitation Counseling

Rehabilitation Institute
in the Graduate School
Southern Illinois University Carbondale
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THESIS APPROVAL

TITLE: EVALUATION OF GENERAL AND SPECIFIC ASSISTIVE TECHNOLOGY
KNOWLEDGE OF STUDENTS WITH DISABILITIES IN POST-SECONDARY
ENVIRONMENTS.

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A Thesis Submitted in Partial

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for the Degree of

Master of Science

in the field of Rehabilitation Counseling

Approved by:

Dr. Thomas Upton, Chair

Mr. Sam Goodin

Dr. James Bordieri

Graduate School
Southern Illinois University Carbondale
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AN ABSTRACT FOR THE THESIS OF

Randall D. Boen, for the Master of Science degree in Rehabilitation Counseling,
presented on May 15, 2014, at Southern Illinois University Carbondale.

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KNOWLEDGE OF STUDENTS WITH DISABILITIES IN POST-SECONDARY
ENVIRONMENTS.

MAJOR PROFESSOR: Dr. Thomas Upton

The use of technology has become fairly integrated into our personal, educational, and professional lives. Students with disabilities attending postsecondary institutions may require the use of Assistive Technology (AT) for their educational pursuits and access to other technology. This study quantified students' general knowledge of AT and specific knowledge of *Dragon NaturallySpeaking* software. In addition, this study examined the relationship between disability support services received and current knowledge of AT among students with disabilities in a postsecondary environment. Participants were recruited from those who received disability support services at a midsize university in Illinois. An online survey was administered to 41 participants that included the Prior Knowledge of Assistive Technology Instrument (PKATI). Results indicated that participants' knowledge was influenced by three factors; prior training in AT within a postsecondary institution, access and availability to AT within postsecondary environments, and personal confidence in understanding of AT.

DEDICATION

I would like to dedicate this thesis in memory of my mother, Debbie Boen.

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CHAPTER ONE

INTRODUCTION

More students in postsecondary settings are using technology than before. Additionally, assistive technology (AT) use among students with disabilities has also increased. Technologies such as speech recognition software, text to speech software, optical character recognition, and recording devices have enabled students to achieve academic success. Furthermore, many of these software functions are continually being incorporated into many mainstream technological devices. Examples include the Eco-Smart Pen or the accessibility features incorporated into the Macintosh operating system (Ketterlin-Geller & Johnstone 2006). These devices are not only helpful for persons with disabilities in educational environments, may be used in many different settings such in business and professional environments (Burgstahler, Comden, Lee, Arnaled & Brown, 2011; Alzahir, 2011).

Widely available technological products have also incorporated AT capabilities. For example, consider the development of the operating system in the *iPhone-5* from Apple. The functions of this operating system include AT that has been integrated into its design. Additionally, the *iPhone* has a function called “Siri” built into its design to offer the user voice recognition for many of the phone’s functions (Apple Inc., 2013). With this increase in technology usage there comes a challenge for evaluating specific technologies use to determine their utility for students with disabilities.

With current advances in technology and a growing market for devices and programs with accessibility features, students with disabilities are able to access more assistive devices that will assist their education. However, prior research into the topic

indicates the extent of knowledge of AT software is somewhat unknown among students with disabilities (Michael, Prezant, Morabito & Jackson 2002). Students' postsecondary educational experiences aid in their preparation toward their future vocational ambitions. In considering how the use of AT impacts the resources that students may utilize in the future, both personally and professionally, it is imperative to ensure that students have the right tools and pre-existing knowledge of this technology. Furthermore, this knowledge will equip students for their personal and professional lives (Whitney & Upton, 2004; Burgstahler 2003).

The main question in this study considered the level of prior training received with AT for students with disabilities in the postsecondary level. Furthermore, this study asked if this support has enabled students to use AT appropriately, independently, and with a foundational knowledge of AT.

Beginning with primary or secondary school, students may have had their first exposure to AT incorporated into their curriculum. Some individuals have even had an Assistive Technology Evaluation that may have established appropriate AT devices for them (Olson & DeRuter, 2002). In addition, some students have had exposure to technology at home and subsequently became proficient at using that specific technology. Regardless of circumstances, understanding this prior level of experience with AT should be the foundation in evaluating prior knowledge of students with AT devices. This research examined prior AT knowledge that students may have obtained.

In postsecondary environments, students obtain the skills for preparation toward their future vocational ambitions. The types of AT students use at this level may have some impact for them both personally and professionally. Therefore, assuring that

students have the right tools and pre-existing knowledge of AT is imperative.

Furthermore, this knowledge will equip students for their personal and professional lives (Whitney & Upton, 2004).

There are two different types of pre-existing knowledge that were evaluated in this study. These include: 1) general knowledge of assistive technology. 2) Specific knowledge of *Dragon NaturallySpeaking*. General knowledge of AT included basic knowledge, appropriate placement, and the basic functions of AT devices. The specific knowledge concern students' understanding of specific technological software. The software chosen for this analysis is a voice recognition software called *Dragon NaturallySpeaking*. This particular software was chosen for this study because of its general popularity among students and professionals alike, plus its overall availability (Heather, 2011).

Demographic information was gathered from each individual who participated in this study. The information included personal information, types of disability services received previously, as well as specific disability services received in post-secondary environments.

Brief Summary of the Literature

During the 2007-08 academic years, 10.8% of all undergraduate students attending two and four year colleges and universities reported having a disability. Therefore, approximately 707,000 students attending postsecondary settings have disabilities (National Center for Education Statistics, 2012). Students with disabilities are attending postsecondary education at increasing rates. In 1979, 3% of persons with

disabilities attended universities, this rate increased to 98% in 2008 (Johnson, Zascavage, & Gerber, 2008).

College graduation is the ultimate goal for all students (Johnson et. al. 2008). Predicting positive outcomes in college for students with disabilities has been the subject of many investigations. Some research has studied attitudes of students with disabilities in postsecondary settings (Alghazo, 2008; Beilke & Yessel, 2009). Other studies have evaluated services received in the past (Johnson, et. al.) in order to predict future success. Another factor which may influence positive outcomes for students involves the students' utilization of AT in their academic pursuits (Revuelta, et. al., 2011).

Disabilities Support Service (DSS) offices provide services to students with disabilities postsecondary educational settings. DSS offices can serve as the primary means for some students to gain access to adaptive technology. In a review of services from DSS offices, the students' prior knowledge of AT was found to reflect services DSS offices provided (Michael, et. al., 2002). These services included time spent on individual training before using the AT, assisting the appropriate use and delivery of AT, and finding available technology for students. Other factors that played a role in whether or not students used technology included in individual learning styles (Thompson, 2005).

An introduction to AT may be provided in students' primary and secondary school experiences. AT integration into the learning experience for students may take the collaboration of many different individuals. The initial training and support may come from parents or legal guardians, classroom teachers, special education teachers and other administrative personnel (Olson & DeRuyter, 2002). All these individuals can also form a multidisciplinary team. This team may be tasked with evaluating the academic strengths

and needs of each child and evaluating the need for other educational services (Assistive Technology Partnership, 2008). Recommendations for AT services may also be incorporated into this process. However, many school districts lack AT procedures (Croasdaile, Jones, Ligon, Oggel & Pruett 2011).

This study was designed to measure preexisting student knowledge of AT. Furthermore, this study determined the level of student knowledge of AT and how prior exposure to these technologies influenced current knowledge. However, another issue of concern is technology misuse or abandonment.

Technology abandonment (TA) is defined as the discontinuation of technology devices, whereby they simply are not being used in any capacity (Verza, Lopes Carvalho, Battaglia, & Messmer 2006; Phillips & Zhao 1993). For example, TA may occur when a student discontinues use of a specific technology due to frustration with the device. There may be many reasons for technological abandonment. Among the most prevalent reasons are poor matching of technology to an individual's need and poor or inadequate training of AT among students (Ebner, 2004). Another factor that may contribute to TA can be due to the assistive technology not being incorporated properly into the student's family life, school or work environments. One report of TA states the abandonment rate is 75% to 80% of all AT use (Ebner, 2004).

Another issue concerning this topic is related to technology acceptance and AT integration into a student's daily life. The consensus among many researchers is that when students have a fair understanding of AT in general and are well acquainted with specific AT they currently use, this situation may contribute to the student's general acceptance of AT.

Scientific Contributions

This study evaluated the prior AT general and specific knowledge among students with disabilities. Furthermore, this evaluation attempted to link students' prior knowledge to their reported use of educational support services. Furthermore, this exploratory study investigated students' knowledge of AT in a postsecondary setting. Rehabilitation Counselors are committed to the personal, social and economic independence of individuals with disabilities (CRCC, 2010). In pursuit of these goals, rehabilitation professionals recognize the importance of research and discovery into the positive outcomes of particular services for persons with disabilities.

The Association for Higher Education and Disabilities (AHEAD) is a national organization that promotes full participation of students with disabilities in postsecondary settings. Individuals who join AHEAD are typically those in direct contact with students who have disabilities in post-secondary settings (Michaels, et al., 2002). The ongoing training and support of students in postsecondary settings is one goal that AHEAD members strive to achieve. The current study evaluates the effects of past and current training of students. Therefore this study is important to the AHEAD organization and to its members.

Significance of the study

This study provided evidence identifying prior knowledge of AT among students with disabilities in postsecondary settings. Another goal for this study was to determine the relationship between students' prior use of disability and educational services and their knowledge of AT. Achieving these objectives required understanding the degree to which prior services influence general or pre-existing knowledge of AT software and

devices. Furthermore, the general ambition for this particular analysis was gauging the level of understanding students have towards devices that may help them.

Specific research questions will be discussed at length in chapter three. These questions surround prior student exposure to and use of relevant AT. Other research questions have been developed and concern students' history of disability services in their academic and personal lives.

The expected outcome of this current study included the increased understanding of student prior knowledge of AT. The results of this study provided evidence for the effects of prior training support for students with disabilities. Furthermore, this evaluation has comprehended the link between prior support and current AT knowledge. The results will potentially impact the delivery of disability support services.

In addition to the potential impacts on service providers, this study produced preliminary content validation on the use of the Prior Knowledge of Assistive Technology Instrument (PKATI) (See appendix A). This instrument was introduced to serve as a tool for professionals towards understanding students' current knowledge of AT. Additionally, the PKATI may help disability support personnel make changes to their approaches to AT training or delivery

Definitions of Terms Used

A student with a disability - an individual with an impairment or activity limitation that substantially limits one or more life activities (Falvo, 2009).

Assistive Technology (AT) has been defined 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” (Assistive

Technology Act of 2004). This definition incorporates many different technological devices and services, which students may benefit from (Guder, 2012). For the purposes of this study AT will be viewed in the context of a technological device that enables individuals to access, comprehend and effectively process digital or electronic information (Rubin & Roessler 2001). Furthermore, this AT use may compensate for any learning difficulties students may have (Alzahir, 2011). The following terms are used to define the particular categories of AT which will be under investigation in this study.

Optical character recognition – the electronic conversion of images or printed text into machine-editable and readable text after capture by scanning (Freedom Scientific, 2013).

Screen Magnification refers to any technological devices that can magnify the screen view on a computer screen (Guder, 2012).

Screen reading software – software that interprets computer screen information and reads it aloud via a synchronized voice (Freedom Scientific, 2013).

Speech recognition software or *automatic speech recognition* – any speech software that converts the human voice into text or commands (West, 1996; Guder, 2012).

Assumptions of this Study

The main assumption posed in this study concerned the relationship between the number of services received and the knowledge base of AT among students in postsecondary settings. This study operates under the assumption that all prior services and training opportunities produced positive outcomes for students. For example, two students can have the same exact training on using an AT device but conclude with different outcomes of future use or general knowledge. This assumption is important to explore as it may open new avenues for research.

CHAPTER TWO

LITERATURE REVIEW

The primary focus of this study concerned the evaluation of prior knowledge of AT among students with disabilities in postsecondary environments. Prior research has been reviewed concerning this subject and can provide the basis for the current study. Six topics have been identified in this review of literature. These include pertinent data gathered which concerns students' use of disability services in secondary and postsecondary environments. Furthermore, prior research into the definitional, utilization, and theoretical constructs of AT has been reviewed.

Assistive Technologies

One definition of AT includes any item, piece of equipment, or product system, whether acquired commercially or off the shelf, modified or customized, that is used to increase, maintain or improve the functional capabilities of individuals with disabilities (Technology-related assistance for individuals with disabilities, 1988). This definition of AT incorporates a broad range of devices to be used by individuals with disabilities. Categories of AT have been defined as aids for daily living, augmentative communication, computer application, environmental control systems, home/worksite modifications, prosthetics and orthotics, seating and positioning, aids for visual/hearing impairments, wheelchairs/mobility aids, and vehicle modifications (Rubin & Roessler, 2001).

Given this broad categorization of AT, this study focuses on one specific area for measuring pre-existing knowledge. Under the stated categories of AT, specific high-tech computer applications are evaluated in this study. As stated previously in the

introduction, the working definition of AT for this study includes any technological device that enables individuals to access, comprehend and effectively process digital or electronic information.

This study examined students' prior history of services both in primary and postsecondary settings. Services identified included special education services in K-12 and disability support services in postsecondary environments. Many factors come into play when examining these support systems or specific trainings students may have received in these educational environments. Within public schools, Croasdaile and colleagues (2011) found many barriers exist, which influence the integration of AT into many students' K-12 grade education. Central among the barriers identified were the lack of administrative interest. Furthermore, in some situations, the school staff was reluctant to integrate specific AT into a student's environment. Another barrier identified concerned issues of communication and collaboration between educational staff and AT coordinators. Lastly, Croasdaile and colleagues found that there might exist a lack of awareness concerning the potential impacts AT may have on student's academic success. The lack of administrative or teaching support can present pervasive limitations.

The National Center for Education Statistics collected a list of information concerning students with disabilities use of educational accommodations in postsecondary institutions. They surveyed a range of two-year and four-year institutions of higher education. During the 2008-09 academic year they found that 77% of DSS offices provided note-taking assistance, 71% provided extended time on exams, and 70% provided equipment and AT for students (NCES, 2011).

Similarly, there may be barriers for students with disabilities in postsecondary environments. The availability of accessible textbooks is one source of concern for many students and the Disability Support staffs who serve them. Textbook manufacturers are not mandated to provide new textbooks in accessible versions to students with disabilities. Other resources exist for such students such as *Bookshare* or *Learning Ally* (services that provide alternative formatted textbooks to students). However, many of these students must work with their Disability Support Service office to access these materials (Dallas & Upton, 2011).

Many students with disabilities in postsecondary environments have negative outcomes such as lower graduation rates. Discrepancies between a student's academic potential and actual performance might be attributed to these outcomes. Other factors may include a learner's simple lack of motivation to apply themselves towards their academic pursuits (Ribeiro et. al. 2011). However, the learner's environment may largely contribute to these negative academic outcomes for students. This may be due to a traditional educational model that relies on a one-way exchange of knowledge from the instructor to the student. These factors may include lack of technological resources or other disability support services for students. This educational environment may not be conducive to students' academic needs and therefore hinders their academic ability within this traditional context (Smutney, 2004; Reis and McCoach, 2002).

Further research into the issue of underachievement among students with disabilities has included intrinsic issues that may contribute to this phenomenon. These issues may concern the disability itself and the individual strengths and needs due to their condition. Additionally, underachievement may be due to the social-emotional

maladjustment of the student in postsecondary environments (Davis, Nida, Zlomke & Nebel-Schwalm, 2009).

Despite the aforementioned factors, much remains unknown about environmental or personal factors that may improve postsecondary outcomes for students with disabilities. Positive outcome variables have included GPA, retention, and graduation rates (Roberts, Park, Brown & Cook 2011). Raskind and Higgins (1998) indicated that little is known about the relationship between the use of AT and positive outcomes for students with disabilities in postsecondary settings.

Offering support to students with disabilities with AT can help facilitate the learning process. Laying, McPhillips, Mulhern and Wylie (2006) conducted a study of participants with reading disabilities in which they offered AT training to students which included speech synthesis, spellchecker, homophone, and an online dictionary. Additionally, they included a control group consisting of individuals who had access to a Microsoft Word Processing system. The aim of this study was to increase literacy rates among students who used AT. Among their findings, the individuals who received training in speech synthesis showed improvements in their ability to comprehend written material. On a cautionary note however, their research found that individual differences impacted the usefulness of this speech synthesis software for students. Therefore, in pairing students with specific AT devices it is important to ensure that the device will aid in student learning and comprehension of materials. Additionally, individual variability among students should be taken under consideration as well.

Predicting the use of technology for educational purposes Ott (2011), proposed that the utilization of appropriate learning platforms might break down educational and

physical barriers. Many in the field of disability studies and AT have suggested that an increased role of technology in educational settings is quite certain in the future (Ribeiro et al., 2011). Furthermore, other researchers postulate a future where the development of new technologies for educational purposes incorporates accessibility features seamlessly into their functions (Ott, 2011).

Some of these technological advances have already become integrated in postsecondary learning environments. These technological systems incorporate principles of universal design for learning. This is a new educational model that incorporates a more conducive learning environment where the instructors and students both contribute to the learning process (Ott, 2011). An example of these systems is called a “Computer Based Collaborative Learning Platform”. This platform may facilitate learning for many people with disabilities. For many with a specific learning disability or attention deficit disorder, the environmental conditions of a traditional classroom may hinder learning due to the presence of extraneous stimuli. Therefore, an online learning environment may be more conducive to a student’s attention on one particular task, contributing to the student’s progress (Tennyson & Jorczan, 2011). However, students still face many barriers in their academic pursuits. Many students with disabilities who need to access these online learning environments may need AT to access this online platform.

Technology Legislation

The introduction of AT into many postsecondary settings has been driven, in part, by state and federal legislation. This legislation has provided funding for the acquiring of AT for many students over the years. Section 504 of the Rehabilitation Act of 1973 was one of the first major pieces of federal legislation to prohibit discrimination in federally

funded institutions of higher education and to facilitate services to individuals with disabilities attending postsecondary education (Dallas & Upton 2011). Section 504 is enforced by the Department of Justice and the U.S. Department of Education to prevent universities from discriminating against qualified individuals with disabilities in accessing university facilities (U.S. Department of Justice 2010). There have also been many pieces of legislation, including sections of the Americans with Disabilities Act of 1990, to increase the availability and access of AT for persons with disabilities (Gregg 2009).

Theoretical Constructs

Some researchers have considered theoretical approaches to students' potential use of AT. These theoretical models suggest that the factors surrounding the person with a disability and his or her environment are primary in determining if an individual will use AT (Rubin & Roessler, 2001). Other theoretical models have included a few different factors. Besides considering the individual and the environment, these models also include the specific task in which the individual uses AT and the specific technology used by the individual (Raskind, 2007). This model might be more conducive to this particular study as it incorporates more factors in the process. Both of these theories take into account the individual characteristics of students who may use AT for educational purposes. The consideration of these factors is therefore important in the proper alignment of specific AT devices with particular students.

Alternatively, Nager and Felber (2010) proposed a different framework. The Technology Commitment Scale was proposed to quantify the degree to which individuals can integrate AT into their daily lives. This model was in the process of being validated

with further research at the time of publication. According to this model, the factors that contribute to technology commitment are acceptance, competence, and internal beliefs. Prior knowledge of AT would fall under the competence factor in this model. These factors also have an interrelated effect on each other. This model describes an individual's commitment to technology is dependent on personal competence with acceptance of the technology. Additionally, this model contends that one's internal belief determines if he or she will be able to use technology in an effective way. This study utilized an adaptive model to examine AT prior knowledge (see appendix D).

This study validated the roles of preexisting knowledge among students who use AT. Although this evaluation may not provide much evidence to support other factors that may determine AT use. However, in examining the role of services and prior training, this study may attempt to further understand the complexity of AT use among students in postsecondary settings.

Summary of Key Findings

The number of students with disabilities attending institutions of higher education continues to increase over the past few decades (NCES, 2012). This increase has been partly due to state and federal legislation that has impacted higher education. Positive outcomes for students with disabilities in these postsecondary environments become increasingly important (Johnson et. al., 2008). Environmental aids, as identified by Ribeiro and colleagues (2011), are one factor that may facilitate learning both in and out of the college classroom.

AT may provide students with the necessary tools they require for their academic pursuits. The AT under consideration for this study will include specific high-tech

computer applications that include *Dragon NaturallySpeaking* (Rubin and Roessler, 2001). Through the utilization of this technology, many students may find their learning environments more conducive to their own academic strengths and deficits (Tennyson & Jorczan 2011). This study will attempt to understand students' prior knowledge of general and specific AT. Researchers have yet to define a correlational link between a student's general use of AT and positive academic outcomes (Raskind & Higgins, 1998; Roberts, et al. 2011). Nevertheless, other research has suggested that proper training and knowledge of AT may impact students' general academic pursuits in postsecondary environments (Croasdaile, et. al., 2011; Ott, 2011; Laying et al. 2006).

This chapter has examined many different topics of AT. The current study contributed to this field of research by evaluating prior knowledge of AT among students with disabilities. Additionally, AT use among these students continues to grow. Barriers to positive outcomes for many students with disabilities can exist whether they are due to environmental, personal factors, or both. In examining prior knowledge of AT, this study will contribute to many human services professionals who work directly with students with disabilities in postsecondary environments (Michaels, et. al., 2002).

CHAPTER THREE

METHOD

Participants for this study consisted of students who were currently enrolled in a midsize university in Illinois. The following criteria for student participation were as follows: 1) Participants were currently enrolled at the university; 2) Participants were among those currently registered with disability support services; and 3) Participants were identified from a list of individuals who were currently receiving, or were eligible for, SIU disability support services. These parameters were established to ensure the individual variability among participants is somewhat controlled for the purposes of this study. An individual with a disability will be defined as one with an impairment or activity limitation that substantially limits one or more life activities (Falvo, 2009).

Three research questions were addressed in this study:

1. What is the prior knowledge of AT among students with disabilities in postsecondary environments?
2. What is the degree of general and specific knowledge among students with disabilities in postsecondary environments?
3. Does prior exposure to disability services received in primary, secondary, and postsecondary environments affect knowledge of AT?

Instruments Used

A survey-based instrument was used to measure prior knowledge in this study. Many different surveys and other scales are often used to measure outcome variables with AT. Several categories of survey types have been used to quantify general AT use

among persons with disabilities (Dharne, 2006). This study relied on an instrument that was developed for the purposes of this analysis.

The demographic form (see appendix B) developed for the purposes of this study collected a variety of data from each participant. This form contains four sections of inquiry. Section one includes personal and educational information including birth, gender and academic standing. Sections two and three of this document included prior history of disability services used. Section two asked about the history of services used prior to attending a postsecondary setting. Section three focused on services received in postsecondary educational setting. Both sections allowed each participant to chronicle their services used in terms of type of services, duration of services and frequency of use of these accommodations. The final section of the demographic form inquired into student prior history of AT use. Additionally, this final section allowed students to indicate their perceived level of general knowledge about AT.

Following the review and completion of the consent and demographic form, participants had access to the Prior Knowledge of Assistive Technology Instrument (PKATI). This document evaluated students' prior knowledge of AT. This consists of two parts. Part one asked about general knowledge and principles of AT. Part two of this document allowed students to respond to questions about a specific voice recognition device called *Dragon NaturallySpeaking*.

The initial development of the Prior Knowledge of Assistive Technology Instrument (PKATI) was conducted for the purposes of this study. This development yielded nineteen questions regarding prior knowledge of general and specific AT devices. For the purposes of content validity, a panel of experts was identified to review the

instrument. During the review process, panel members assessed the quality of test items in the PKATI. In addition, the instrument underwent several corrections and modifications between each review. The panel was identified as of a group of individuals with a range of professional backgrounds in both disability studies and rehabilitation counseling. Individuals from Southern Illinois University and Northern Illinois University were identified to review this document.

The development of the PKATI for this study consisted of its preliminary construction, development, and review by other professionals. A full review of the PKATI and potential uses for future evaluations were beyond the scope of this particular study. The demographic form was also created for this study. The initial development of this form was conducted by the principal investigator under the supervision of the faculty supervisor for this study.

Participants had access to the consent and code ID forms (see appendix E). The code ID form linked (through numerical values) the participants' consent forms to the demographic and PKATI documents they completed. Additionally this document collected contact information for the purposes of compensation and debriefing.

Variables Used

The study utilized participants' history of services and other individual characteristics gathered by the demographic form to be used as the independent variables (IV). The information gathered on the demographic form included four primary areas: 1) Personal information, 2) Disability services prior to attending college, 3) Postsecondary disability support services, 4) Prior AT Exposure. The dependent variable for this study was the individual's score on the PKATI (see appendix C).

Participants

This study involved three basic steps. First, the development of many study materials and the PKATI took place. Secondly, after the study was conceptualized and approved by a departmental committee, materials were submitted to the Departmental Thesis Committee and University's Human Subjects Committee (HSC). Finally, following approval, data collection and analysis was conducted as specified below.

Recruiting Participants

Participants for this study were identified as students with disabilities attending university. The primary means of participant recruitment took place within the university's Disability Support Services (DSS) Office. The DSS served approximately 700 students at the time the study was conducted. The use of e-mails was used to inform students of the study and request their participation. The e-mails used to recruit participants can be seen in appendix F.

Individuals interested in taking part in this study had two options for participation. The first option was to complete all documents on their own using an online link to a survey database called Lime Survey. The second option included participating within the university's DSS office.

After the approval by the department and by the Human Subjects Committee was obtained, data collection could commence. The Director of the DSS office allowed for student contact via e-mail requesting participation in this study. Attempts at student contact included four letters (e-mail messages) that were separated by one-week intervals.

Data Analysis

With the utilization of the PKATI, data was acquired to determine the effects of

prior exposure to AT. This scale was constructed with two separate parts—general knowledge and specific knowledge. Each question was designed to prompt one specific answer from the participants. Scoring from this instrument resulted in a value of 1 or 0 for each question depending on whether the participant got the answer right or wrong. These values were added up from each part and resulted in two scores. Part 1 (general knowledge) resulted in a value between 0 and 12. Part 2 (specific knowledge) resulted in a value between 0 and 4. Data was collected and analyzed using correlational analysis of the data gathered using the demographic form.

The second research question concerns the degree of knowledge for both general and specific knowledge among students with disabilities in a postsecondary environment. The degree of knowledge was determined from the PKATI using the following predetermined criteria. Individuals' scores on the PKATI were categorized within the three numerical ranges. The results from part 1 (general knowledge) resulted in the determination of “little knowledge” (any score between 0-3), “moderate knowledge” (any score between 4-7), and “most knowledge” (any score between 8-11). The results from part 2 (specific knowledge) resulted in the determination of “little knowledge” (any score between 0-1), “moderate knowledge” (any score of 2), and “most knowledge” (any score between 3-4).

The final research question concerned the prior exposure to disability services received in primary, secondary, and postsecondary environments. Furthermore, did this exposure to services or other individual factors influence current knowledge among students with disabilities in regards to general and specific AT? Prior exposure to

services and other individual characteristics was measured using the demographic form.

The prior knowledge of AT was gathered using the PKATI.

CHAPTER FOUR

RESULTS

Forty-one college students from a large Midwestern university took part in this study. Fifteen participants also attempted to participate but didn't complete all required study materials and therefore their responses were not included. Among the individuals who participated in this study (n=41), there were 22 males (53.7%) and 19 females (46.3%). The average age of those who participated was 32. Sixty-three percent of the individuals who participated in this study were undergraduate students (n= 26) and 15 students (36.6%) reported attending graduate school. The respondents reported various disabilities and an overview of these disabilities follows. First, learning disabilities were the most frequently reported among participants (n=11), followed by mobility impairment (n=9), other (n=8), cognitive or psychological disorders (n=6), visual impairment (n=5), and deaf or hard of hearing (n=2). Further demographic information related to the participants can be found on table 1. Data analysis was conducted using IBM Statistical Package for the Social Sciences (SPSS). Correlational coefficients were primarily used in this study. Kendall's tau-B correlation coefficients were primarily used to determine significant relationships between ranked variables. Pearson's correlational coefficient was used to examine data from un-ranked variables (Mukaka 2012). A *p* value of .05 was required for significance in all the computed data.

The first research question was; what is the prior knowledge of AT among students with disabilities in postsecondary environments? To address this question, the raw data gathered from the data collection process were analyzed within SPSS. Participants' responses on the PKATI (parts 1 and 2) were transformed for analysis

through a process of assigning correct responses to a value of 1 and incorrect responses a value of 0. Summing these values equated to a total score for each participant.

Considering the total scores across all 41 participants, the average score was 8.54 (SD- 1.69; Min- 4; Max-11) for PKATI part 1, and 0.85 (SD- 1.04; Min – 0; Max - 3) for PKATI part 2. Additional descriptive results for the PKATI (parts one and two) can be found on table 3.

The second research question was; what is the degree of general and specific knowledge among students with disabilities in postsecondary environments? The total number of correct responses were summed up and then grouped together. Table 3 illustrates the descriptive parameters of these total scores (n-41) including PKATI Part 1 (M – 8.45; SD -1.68) and Part 2 (M - .85; SD – 1.04) Due to the lack of standardization and validation for the PKATI, further analysis was beyond the scope of this particular study.

The last research question was; does prior exposure to disability services received in primary, secondary, and postsecondary environments affect knowledge of AT? The participants' reported use of *Dragon NaturallySpeaking* was positively related to the scores they received on the PKATI part 2 $r(40) = 0.59, p < 0.01$.

In regards to the question concerning participants' perceived confidence in their own understanding of AT, there was a significant positive correlation to their general knowledge score on both scales. Part 1 of the PKATI had an correlation of 0.42, and Part 2 had a correlation of 0.30 Additionally, participants who indicated greater prior experience with AT in postsecondary environments also had higher scores on the second part of the PKATI $r(40) = 0.28, p = 0.04$. Table 2 includes similar results from this study.

CHAPTER FIVE

DISCUSSION

The purpose of this exploratory study was to examine the prior knowledge of general and specific assistive technology among students with disabilities in a postsecondary setting. This study was also intended to link specific demographic information with a student's knowledge of AT. During the course of this study, a new scale called the Prior Knowledge of Assistive Technology Instrument (PKATI) was developed with the purpose of quantifying general and specific AT knowledge.

Data collection from 41 participants provided evidence to support several general conclusions. First, individuals who reported using *Dragon NaturallySpeaking* had relatively higher scores on the PKATI part 2. From this result, one may assume that the use of this particular device may have a positive correlation with the specific knowledge of that device ($r = 0.59$). In addition, the second result provided evidence to suggest that individuals who reported obtaining some training or support in AT within the postsecondary level had slightly higher scores on the PKATI. This result may suggest that the level of training in AT may equate to a higher degree of knowledge of AT. Finally, students' perceived confidence in their understanding of AT was positively correlated with their scores on the PKATI. Part 1 of the PKATI had an r of 0.42 and Part 2 had an r of 0.30.

The Technology Commitment Scale, as proposed by Nager and Felber (2010), is supported by these results. As detailed previously, the framework proposed that AT competence is based on an individual's acceptance, competences, and internal beliefs. This study provided some support for that model by showing that individuals' perceived

confidence in their knowledge of AT was related to higher scores on the PKATI. Given the scarcity of prior research on this particular subject, a new theoretical framework was put forth for this study (see appendix D). This framework was conducted upon many existing frameworks including that of Nager and Felber. The factors used to conceptualize the current framework was based upon four different factors and prior knowledge of AT. Future investigations may utilize this framework towards determining the intersections of these items.

Other theoretical constructs proposed by Rubin & Roessler (2001) and Raskind (2007) could neither be supported nor refuted by the results of this study. The amount of data gathered, although sufficient for this study, did not provide evidence to align with this prior analysis.

Considering prior knowledge of *Dragon NaturallySpeaking*, the results from this study suggest that one's understanding of this specific device is less than the overall general AT knowledge. This result may simply indicate that this software is less used among students who took part in this study. Prior research indicates that speech recognition software has the potential to facilitate positive academic outcomes for students with disabilities in secondary and post-secondary environments (Straub & Alias 2013; Burgstahler 2003). Therefore future investigations may inquire into prior knowledge of *Dragon NaturallySpeaking* among students who report using the software previously.

As with other research, the results of this study did not provide evidence to support the relationship between the use of AT and positive academic outcomes (Raskind & Higgins, 1998; Roberts, et. al. 2011). These results were expected due to the nature of

this particular study. Future evaluations may look at participants' knowledge of AT using a longitudinal study design (Burgstahler 2003).

Limitations

There were several limitations inherent in this study. These limitations include the limited number of participants included in the study and the development of a new instrument for use in a scientific study. Data were collected and analyzed from only 41 participants. However, considerations must be given to the fact that students may choose not to participate. In consideration of the research questions proposed in this study, more participation would have been preferable. In addition, due to a smaller sample size, certain questions arise concerning the external validity of the results found.

The development and use of the PKATI for this study added significant limitations to the results of this particular study. Prior to its use, the PKATI underwent review by several experts to examine construct validity issues. However, the primary threats to validity of the PKATI concern lack of test items, sampling variability and possible scoring errors (Drummond & Jones 2010).

This study did not collect data to support the reliability of the PKATI. Content sampling error may have influenced the assessment of prior knowledge of AT. Additionally, given the many types of AT that exist, forming any prior knowledge scale concerning AT becomes difficult (Rubin and Roessler 2001). Furthermore, the quality of the test items developed for the PKATI may have influenced how participants responded to each item (Drummond & Jones 2010). Given these concerns, application of the findings from this study becomes questionable. Further analysis may take these concerns into further review when using the PKATI. A factor analysis of the instrument's items

conducted with a much larger sample may be required to determine the validity and reliability of this instrument.

Summary

Assistive technology has the potential to improve the lives of persons with disabilities. Through its use, individuals may access, comprehend and effectively process digital or electronic information (Rubin & Roessler 2001). This study was conducted under the assumptions that prior knowledge of AT may have some impact on student's use (Michael, Prezant, Morabito & Jackson 2002). Additionally, AT may have a positive impact on students' post-secondary experience (Burgstahler 2003)

This study yielded evidence to support three factors that may influence prior knowledge of general and specific AT. The factors were all found to have a positive correlation with prior knowledge of AT. The factors included prior training in AT within a postsecondary institution, access and availability to AT in postsecondary environments, and personal confidence in understanding AT. A number of other factors were found not to have similar relationships with prior AT knowledge. However, due to the limitations of this study, further investigation is warranted. Future analysis may utilize the same or similar methods of the current study and may address the validity or reliability concerns of the PKATI. Alternately, given the concerns regarding the types of assistive technology, the PKATI may address fewer assistive technology devices by which prior knowledge is measured.

Table 1.

Demographic information from all participants

Demographic	n	percent	mean
Gender			
Male	22	53.7%	
Female	19	46.3%	
Academic standing			
Freshman	4	9.8%	
Sophomore	5	12.2%	
Junior	4	9.8%	
Senior	13	31.7%	
Graduate Student	15	36.6%	
Average GPA			3.36*
Disability Status			
Deaf of hard of hearing	2	4.9%	
Visual Impairment	5	12.2%	
Learning disability	11	26.8%	
Cognitive or psychological disorder	6	14.6%	
Mobility impairment	9	22.0%	
Other	8	19.5%	

* On a 4.0 grading scale

Table 2.

Notable research findings

Factor	PKATI (Part 1)	PKATI (Part2)
Disability Services received prior to attending college	.07 ^a	.21 ^a
Reported use of AT in secondary environments	.25 ^a	.06 ^a
Number of disability-related services in secondary environments	.19 ^a	.04 ^a
Postsecondary Services	.12 ^a	.25 ^a
Number of services in postsecondary environments	.21 ^a	.25 ^a
Reported training of AT in post secondary environments	.10 ^a	.28 ^{*a}
AT exposure		
Subjective confidence in AT knowledge	.27 ^{**a}	.22 ^{*a}
Use of AT in postsecondary environments	.06 ^a	.45 ^{** a}
Use of Dragon NaturallySpeaking	.05	.59 ^{**}

^a Calculated using Kendall's tau Correlation Coefficient

* P < .05

** P < .01

Table 3.

Descriptive statistics of both parts of the PKATI

	<u>PKATI (Part 1)</u>	<u>PKATI (Part 2)</u>
Mean	8.54	.85
Std. Deviation	1.69	1.04
Variance	2.85	1.08
Range	7.00	3.00
Minimum	4.00	.00
Maximum	11.00	3.00

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APPENDICES

APPENDIX A

Confidential—00

Prior Knowledge of Assistive Technology Instrument: (Part 1 General Knowledge)

Instructions: Please Answer the following questions to the best of your ability. Choose the single BEST answer.

1. What can speech recognition software do?
 - a. Read printed materials
 - b. Read words aloud by simply scanning over printed text with a device
 - c. Help students write papers by using their voice
 - d. Help wheelchair users get around their physical environment

2. What is optical character recognition?
 - a. Refers to a software that may alter the size, shape, or color of mouse cursors
 - b. A portable audio player that can store audio books and other files
 - c. A program that can convert Microsoft Word documents into braille pages
 - d. A process by which print materials are converted in to digital formats.

3. What is the main purpose of screen reading software?
 - a. It recognizes information that appears on a computer screen and reads this information aloud to the user.
 - b. It alters the contrast of the image on the computer screen
 - c. It can convert Microsoft Word documents into Adobe PDF Documents
 - d. It can create an audio recording

4. Which of the following assistive technology devices may be the most helpful for individuals with a visual impairment?
 - a. Speech Recognition software
 - b. Screen Magnification devices
 - c. Screen Reading Software
 - d. Both B and C

5. Which of the following assistive technology devices may be the most helpful for individuals with a learning disability?
 - a. JAWS (Job Access with Speech)
 - b. Kurzweil 3000
 - c. A refreshable braille device
 - d. Zoom Text

6. Which of the following assistive technologies may be the most helpful for individuals with a hearing loss?
 - a. Dragon Naturally Speaking
 - b. A program which alters any system's sounds into a visual indicator for the student.
 - c. Software that alters the contrast or color of a computer screen.
 - d. None may be helpful

7. A "Victor Reader Stream" is a device that can be:
 - a. Used as a handheld magnifier
 - b. Used as a portable audio player that stores audio books and other files
 - c. Used to convert text and other parts of the Windows operating system into speech

8. What is the function of an "Echo-Smartpen"?
 - a. A pen that audio records every lecture or meeting while writing
 - b. A device that allows individuals to take pictures
 - c. Software which can magnify a computer screen
 - d. A device that when pressed, reads aloud the current time and date

9. "Magic" is an example of which of the following assistive technology
 - a. Speech Recognition software
 - b. Screen Magnification software
 - c. Screen Reading Software
 - d. Optical character recognition

Please read the following statements and indicate if you agree or disagree with the statement.

10. Any new assistive technology given to a student should be considered with many different factors in mind including individual needs, environmental factors, and specific tasks.
 - a. Agree
 - b. Disagree

11. In the state of Illinois, students may obtain funding from the Illinois Department of Rehabilitation Services (IDRS) to obtain a piece of assistive technology that can help them in school.
 - a. Agree
 - b. Disagree

12. According to federal law, any college or university receiving federal funding must provide access to programs and services for enrolled students with disabilities.
 - a. Agree
 - b. Disagree

Prior knowledge of assistive technology instrument: (Part 2: Specific Knowledge)*Confidential—00*

Instructions: Please answer the following questions to the best of your ability. Choose the single BEST answer.

- 13.** Have you used Dragon NaturallySpeaking in the past?
- Yes. (Please proceed to questions 14-16)
 - No. (Please proceed to questions 17- 19)
- 14.** The main purpose of Dragon NaturallySpeaking is to _____.
- Recognize textbook print and make audio versions of them.
 - Recognize and convert the human voice to text.
 - Recognize and magnify the commuter screen
 - Recognize pictures on a sheet of paper and describe them to the user.
- 15.** Dragon NaturallySpeaking can recognize:
- One specific user's voice after a simple training
 - Only specific voices, after extensive training.
 - Several different voices after simple training
 - Any voice, no training is necessary
- 16.** The total cost for a new Dragon NaturallySpeaking Home edition for one computer is approximately:
- Under \$50.00
 - Between \$50.00 and \$150.00
 - Between \$150.00 and \$250.00
 - Over \$250.00.

Prior knowledge of assistive technology instrument: (additional questions)*Confidential—00*

17. I have confidence in my understanding of the definition of assistive technology

- | | | | |
|----------------|-------|----------|-------------------|
| a. | b. | c. | d. |
| Strongly Agree | Agree | Disagree | Strongly disagree |

18. I've used assistive technology in high school

- | | | | |
|--------|--------------|------------|-----------------|
| a. | b. | c. | d. |
| No use | Infrequently | Frequently | Vary frequently |

19. I use/used assistive technology in college

- | | | | |
|--------|--------------|------------|-----------------|
| a. | b. | c. | d. |
| No use | Infrequently | Frequently | Vary frequently |

Thank you for your participation. Are there any questions you think we missed regarding assistive technology on this scale? (Optional):

APPENDIX B

Demographic Form (Section 1)*Confidential—00*

Demographic form: Personal Information (Section 1)

Instructions: The information you provide on the sheet will be kept secured to insure your confidentiality.

Date of birth ___/___/_____

 Gender: – Male
 -- Female

 Academic standing: Freshman
 sophomore
 Junior
 Senior
 Graduate student

 Major: _____
 Minor: _____

Current GPA: _____

 Disability: Deaf or hard of hearing
 Visual impairment
 Learning disability
 Cognitive or psychological disorder
 Mobility impairment
 Other : _____

Demographic Form (Section 2)*Confidential—00*

In what county did you attend high school?: _____

State: _____

Did you receive any disability support services while in grade school (Kindergarten through High school)?

 No (Please proceed to Section 3) Yes (Please indicate educational support services used) Special Educational Services (K- 12 grade) Department of Rehabilitation Services Other services: _____

Please indicate the type of services you received in grade school: (Please select all that apply)

 Extend time on text Note taking Interpreting services *Computer Assisted Realtime Translation (CART)* Listening Device Lab Assistance Reader Text Conversion Assistive technology Attendance concerns Record Lectures Other: _____

Please indicate the number of years you received these services:

 Under 1 year 1 - 3 years 3- 5 years Over 5 years

In what grade year did you discontinue these services?: _____ Grade

Demographic Form (Section 3)*Confidential—00*

Do you currently receive, or have you ever received disability support services while in college?

- No (Please proceed to Section 4)
 Yes (Please indicate educational support services used)

- Disability Support Services at Southern Illinois University
 Achieve Services at Southern Illinois University
 Special Educational services (K- 12 grade)
 Department of Rehabilitation Services
 Other services: _____

Please indicate how you became aware of Disability Support Services on the SIU Campus:

- Referred by grade school personal (Guidance counselor, teacher, school psychologist etc.)
 Referred by post-secondary personal (Instructor, Counselor, other staff)
 Referred by friend, parent, or other family member.
 Referred by personal doctor or psychologist
 You located the services on your own (e.g. from website, promotional fair or in another way)
 Other: _____

Please indicate the type of services you received in any post-secondary setting: (Please select all that apply)

- Extend time on text
 Note taking
 Interpreting services
 Computer Assisted Realtime Translation (CART)
 Listening Device
 Lab Assistance
 Reader
 Text Conversion
 Assistive technology
 Attendance concerns
 Record Lectures
 Other: _____

Please indicate the number of years you received these services:

- Under 1 year
 1 - 3 years
 3- 5 years
 Over 5 years

Demographic Form (Section 4)

Please answer these questions to the best of your ability.

Definition: Assistive technologies include 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 individuals with disabilities.

1. Have you received any specialized training or instruction for using assistive technology in the past?

No
 Yes (Please explain):

2. Have you used any assistive technology in the past for educational purposes?

Yes (please answer questions 3 through 5)
 No (Please answer question 5)

3. Indicate the types of assistive technology that you have used in the past.

Speech Recognition software
 Screen Magnification devices
 Screen Reading Software
 Other (please specify): _____

4. Please indicate the number of years you have used these technologies:

Under 1 year
 1 - 3 years
 3- 5 years
 Over 5 years

5. How often do you use any technology in general for school, work, or for socializing with friends?

Multiple times per day
 About once per day
 A few times per week
 infrequently

APPENDIX C

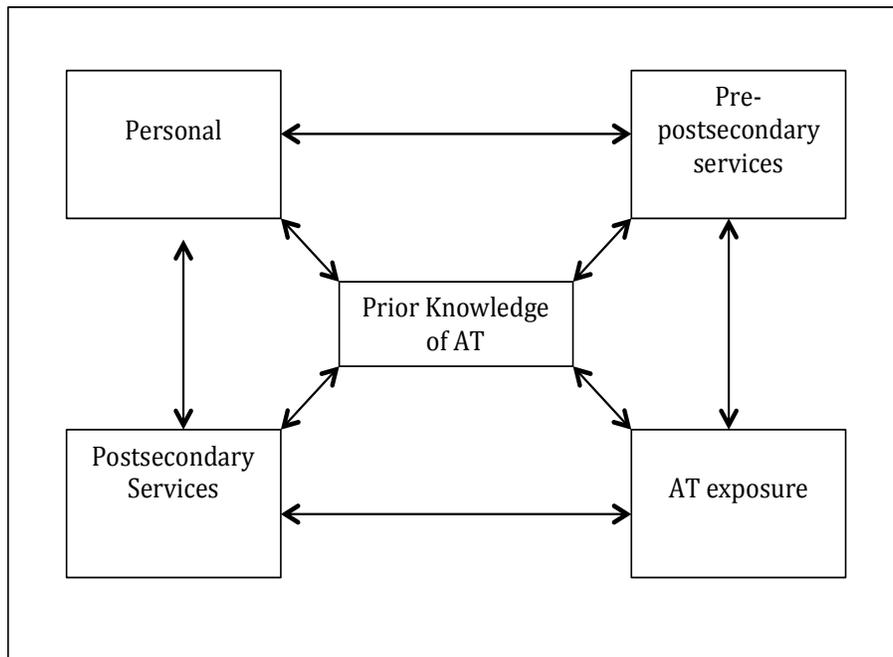
Variables under review

Independent variables*	Dependent variable**
Personal <ol style="list-style-type: none"> 1. Gender 2. Academic standing 3. Reported disability status 4. Reported GPA 5. Geographical location of secondary school 6. Reported history of past general technology use. 	
Disability Services received prior to attending college <ol style="list-style-type: none"> 1. Number of services in secondary environments 2. Type of services received in secondary environments 3. Duration of services received in secondary environments 	Scores on PTAKI (part 1)
Post-secondary Services <ol style="list-style-type: none"> 1. Number of services in post-secondary environments 2. Type of services in post-secondary environments 3. Duration of services in post-secondary environments 	Scores on PTAKI (Part 2)
AT exposure <ol style="list-style-type: none"> 1. Prior reported history of assistive technology training 2. Prior reported history of assistive technology use 3. Prior reported history of assistive technology 4. Duration of prior history of assistive technology use 	

* *IV with listing of specific information that relates to demographic data.*

** *DV under review in this study.*

APPENDIX D

AT prior knowledge theoretical construct

APPENDIX E

CONSENT FORM

Confidential- 00

My name is Randall Boen. I'm a graduate student in the Rehabilitation Counseling Program at Southern Illinois University-Carbondale. I am asking for your participation in my research study. The purpose of my study is to measure the pre-existing knowledge of Assistive Technology.

Participation is voluntary. If you choose to participate in the study, it will take approximately 15-30 minutes of your time. For this study you will be asked to complete two forms. The first form will ask you a series of personal questions (i.e. date of birth) followed by questions regarding your prior use of disability-related services and other similar experiences. The second form comprises of nineteen questions on assistive technologies.

Excluding this document, please do not include any personal information that could be used to identify yourself on any other document you review; this includes your name or Dawg Tag number.

You are not required to sign this consent form and you may refuse to do so without affecting your right to participate in any assistive programs or events offered by SIU or any services you are receiving or may receive. However, if you refuse to sign this form, you cannot participate in this study.

You may withdraw your consent to participate in this study at any time. If you choose to withdraw from the study before data collection is completed, any collected data will be destroyed and not used. All your responses will be kept confidential within reasonable limits. Only those directly involved with this project will have access to the data.

If you have any questions about the study, please contact me. My phone number is (608) 799-0500 or randallboen@siu.edu. The faculty adviser for this study is Dr. Thomas Upton of the Rehabilitation Institute. He may be reached at (618) 453-8287 or tupton@siu.edu.

Thank you for taking the time to assist me in this research.

Participant Signature

Date

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

APPENDIX F

E-mail letters to students

Subject: Research Request

Dear Students,

Have you ever wondered about how technology is shaping your educational experience? Have you reflected on how your experiences in high school or college have influenced the ways you view or use technology for school? Do you wish you knew more about new and exciting educational technology being developed every day?

There are many questions that exist about the application of technology in the classroom, and I need your help in answering some of these questions. I'm asking for your time to participate in a study I'm conducting this semester. This study will take you around 15-30 minutes to complete. Your participation is voluntary and your identity will remain confidential throughout the process.

Everyone who participates will be entered into a drawing to win a \$50.00 visa gift card! Once I collect all the surveys I'd be happy to share my results with you.

Interested... but want more information? Contact Randall Boen at (608) 799-0500 or randallboen@siu.edu. The Faculty adviser for this study is Dr. Thomas Upton of the Rehabilitation Institute. He may be reached at (618) 453-8287 or tupton@siu.edu. Want to take the survey? Please go to: [\(Link\)](#)

You have been contacted because of your utilization of Disability Support Services at SIU. If you don't wish to be contacted again, simply reply to this message and include "Opt-out" in the subject line. If you don't respond to this survey or send the opt-out message, you will be contacted again with this request 3 times during the next 3 weeks.

Thanks for your time, Randall

Randall Boen
Graduate Student
Rehabilitation Counseling

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

Follow-up e-mail letter to students

Subject: Research Request

Hello Again,

The following email is to act as a friendly reminder to one I sent on (date)

Have you ever wondered about how technology is shaping your educational experience? Have you reflected on how your experiences in high school or college have influenced the ways you view or use technology for school? Do you wish you knew more about new and exciting educational technology being developed every day?

There are many questions that exist about the application of technology in the classroom, and I need your help in answering some of these questions. I'm asking for your time to participate in a study I'm conducting this semester. This study will take you around 15-30 minutes to complete. Your participation is voluntary and your identity will remain confidential throughout the process. If you have already participated in this study, thanks again for your time, you may discard this message.

Everyone who participates will be entered into a drawing to win a \$50.00 visa gift card! Once I collect all the surveys I'd be happy to share my results with you.

Interested... but want more information? Contact Randall Boen at (608) 799-0500 or randallboen@siu.edu. The Faculty adviser for this study is Dr. Thomas Upton of the Rehabilitation Institute. He may be reached at (618) 453-8287 or tupton@siu.edu. Want to take the survey? Please go to: [\(Link\)](#)

You have been contacted because of your utilization of Disability Support Services at SIU. If you don't wish to be contacted again, simply reply this message and include "Opt-out" in the subject line. If you don't respond to this survey or send the opt-out message, you will be contacted again with this request 2 times during the next 2 weeks.

Thanks for your time, Randall

Randall Boen
Graduate Student
Rehabilitation Counseling

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

VITA

Graduate School
Southern Illinois University

Randall Boen

Randallboen@siu.edu

Austin Peay State University
Bachelor of Science, Psychology, May 2010

Special Honors and Awards:

Lorenz/ Baker Student Award SIU. 2013

Outstanding May Graduate in Psychology APSU. 2010

Most Valuable Member Award, Psi Chi /Psychology Club APSU. 2009

Thesis Title:

Evaluation of General and Specific Assistive Technology Knowledge among
Students with Disabilities In Postsecondary Environments.

Major Professor: Dr. Thomas Upton

Publications:

Boen, Randall & Knickmeyer, Nicole; Upton, Thomas. Anuar, Azzahrah. (2013)
Questions of fairness: Perceptions of Educational Accommodations by Others in
the Classroom (In press).