Vocational Rehabilitation Counselors' Perception of Assistive Technology/Rehabilitation Technology

by

Scott Renner

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Approved by

E. Davis Martin, Jr., Chair, Wayne T. Smith Distinguished Professor, Department of Special Education, Rehabilitation and Counseling
Rebecca Curtis, Associate Professor, Department of Special Education, Rehabilitation and Counseling
Marie Kraska, Mildred Cheshire Fraley Distinguished Professor, Department of Educational Foundations, Leadership, & Technology

Abstract

Vocational Rehabilitation (VR) counselors are not providing adequate Assistive Technology/Rehabilitation Technology (AT/RT) to individuals with significant disabilities (Gamble et al., 2006). Rehabilitation professionals have identified AT/RT as an area in which more training is needed, and the provision of AT/RT education will likely lead to more effective rehabilitation counseling services and outcomes (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007). However, there is a lack of information related to VR counselors' confidence in their ability to identify and provide AT/RT services and equipment, perceptions of AT/RT, and perceptions of AT/RT training needs.

This research study identified counselors' confidence in their ability to identify and provide AT/RT services and equipment, counselor perceptions of AT/RT, and their perceptions of their AT/RT training needs as measured by the Rehabilitation Technology Counselor Survey (RTCS). Forty (VR) counselors employed by one large state VR program located in the southeast region of the United States completed the online survey. A majority of the VR counselors were female and between the ages of 23 to 55 and older. Results for the first null hypothesis show a statistically significant difference in counselor confidence in identifying and providing AT/RT services for counselors who perceive AT/RT as part of their role and those who do not, $F(1, 38) = 26.64$, $p = .000$. The Levene's test for equal variances showed no statistically significant difference on the dependent variable for those counselors who viewed AT/RT activities as part of their role and those who did not. Due to the study participants being employed by only one state VR agency, the results cannot be assumed to reflect the population

of all VR counselors serving individuals with disabilities. More research is needed to better understand the perceptions, role, and confidence level VR counselors have regarding AT/RT services and equipment.

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Preface

The Technology Related Assistance for Individuals with Disabilities Act of 1988, commonly known as the Tech Act, defines Assistive Technology device as any item, piece of equipment, or productive system whether acquired commercially off the shelf, modified or customized that is used to increase, maintain, or improve the functional capabilities of individuals who are disabled [sic] (Pub. L. 100-407). With this law, Congress spoke about the potential of AT to help "individuals with disabilities [be] able to pursue the American Dream" (U.S. House of Representatives Report 103–208, 1993, p. 6).

In his welcoming remarks at Auburn University's third annual Alabama Assistive Technology Conference in the Fall of 2012, Dr. E. Davis Martin noted that Assistive Technology is the great equalizer toward independent living for people with disabilities. "We've made tremendous progress, but our challenge now is to help society see this and continue to move into the mainstream of all aspects of American life. Assistive Technology (AT) opens up for us many arenas of life and helps us capture the American Dream" (ACDD Advocate, 2012, p. 11). Though we may be, as Martin suggests, only at the beginning of a long and triumphant march toward progress and inclusion, there are still thousands upon thousands of stories of Americans whose lives have been profoundly and positively impacted by the use of AT. Here is one of those many examples.

On August 15, 1992, the life of a young man, age 28, was impacted by the Tech Act and its subsequent amendments and related legislation when he dove into shallow water, hit the river bottom, and acquired a C3-C4 spinal cord injury leaving him with paralysis from just below his shoulders. After several medical complications and procedures, the individual was transported from a medical hospital to a rehabilitation facility. Upon his arrival, he had assessments

conducted by a team of physicians, nurses, and physical, occupational, and recreational therapists. During the recreational assessment, the therapist told the young man that there were 10,000 things he could do before his injury and that there are now 9,000 things he could do, thanks to AT.

During the rehabilitation process, the young man was introduced to various types of low- and high-tech AT. He learned to operate a Sip 'N Puff wheelchair through a computer software program. In order to access a computer, he was educated on the utilization of a head pointer, an on-screen keyboard, voice activation software, as well as a mouth stick. The mouth stick allowed him to turn pages, type on a computer, dial a telephone, and operate a recorder and remote controls. The most significant remote he would now use was the one that controlled his environment, including, but not limited to, lights, appliances, thermostat, and an electric door opener.

After successful rehabilitation, the young man returned home and began to realize just how important AT was for independent living, education and employment. He began to develop low AT devices such as a drinking system for his wheelchair and bed so as to keep hydrated without assistance from others. He designed and had a work station built that allowed him to access his computer, telephone, and books on stands.

Having a work station afforded him the opportunity to study independently when he returned to college to earn his Master's degree. During his graduate studies, he was introduced to a Rehabilitation Counselor who began discussing employment options for his future. After graduation, he continued to utilize AT for gainful employment. This young man continues to utilize AT today for independent living, education, employment, recreation and leisure. AT has

given him the opportunity to accomplish those 9,000 things his therapist spoke of and to live the American Dream just as Congress intended when it passed the Tech Act.

The author of this study has intimate knowledge about the life and struggles and triumphs of the aforementioned young man, because it is his own story. When he was recently hospitalized and on life support, it was AT that allowed him to communicate with nursing staff and family members. It was AT that afforded him the opportunity to work while completing his recovery when he returned home. It is AT that allows him to accomplish his duties at work on a daily basis. In many ways it is AT that allows him to live a full life, deeply invested in his community, and grateful for each day that he has an opportunity to contribute to the march toward progress that Martin referenced in his Conference remarks.

Scott Renner

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Date

CHAPTER I. INTRODUCTION

Assistive technology/rehabilitation technology (AT/RT) can be used to enhance employment opportunities for individuals with significant disabilities (Langton & Ramseur, 2001). As a result, it is imperative that vocational rehabilitation (VR) counselors be confident regarding AT/RT services and equipment available to their consumers. Providing effective AT/RT services and equipment is vital in enhancing employment outcomes. Given their role, VR counselors often provide an essential link between the consumer and the assessment and acquisition of AT/RT. VR counselors must be well versed in not only the functional impairments related to significant disabilities, but also be exposed to intensive training related to AT/RT. The emphasis on consumer choice in the rehabilitation process has been in existence for some time, but the implementation of this process (particularly for those with the most significant disabilities) has not necessarily been well explicated or implemented. When AT/RT is appropriately matched to the individual using aspects of the environment, needs and preferences of the individual, and functions and features of the AT/RT considered, it has a great capacity to aid the individual in gaining increased independence and success in meaningful employment (Gamble, Dowler, & Orslene, 2006). Despite the success of the Federal-State partnership in providing access to AT/RT services and equipment, there is a continued need to provide information about the availability of AT/RT, advances in improving accessibility and functionality of AT/RT, and appropriate methods to secure and utilize AT/RT in order to maximize the independence and participation of individuals with disabilities in society (Fraser, Vandergoot, Thomas, & Wagner, 2004).

Several models of direct service delivery have been developed in state VR agencies to provide AT/RT services and equipment for individuals with significant disabilities (Noll, Owens,

Smith, & Schwanke, 2006). Some states have hired AT/RT specialists, some use outside vendors while others utilize VR counselors. Regardless of the AT/RT service delivery model, the VR counselor assigned to work with the individual has the critical role to identify and provide AT/RT services (Noll et al., 2006).

Recent developments in outcomes assessment research confirm the importance of appropriate early assessment of consumer needs for AT/RT. As the available options and features of assistive technologies have increased, their use has been more widely considered and recommended. Differences among individual users can be better accommodated due to this expanded choice; however, the process of matching person and technology remains complex because people's expectations of and reactions to technologies are complex (Scherer, Sax, Vanbiervliet, Cushman, & Scherer, J.V., 2005).

The three main critical groupings of functions for VR counselors to perform in relation to AT/RT are: (1) identifying the need for AT/RT services and equipment, (2) providing information regarding AT/RT to the consumer, and (3) coordinating AT/RT services. In order to perform these functions, VR counselors need intensive training in the area of AT/RT but are often provided with only basic level information. The Council on Rehabilitation Education (CORE) lists AT/RT as a study area or course to be provided for program accreditation, and training on this topic is expected for graduates sitting for the Certified Rehabilitation Counselor (CRC) examination. However, at the graduate level, AT/RT coursework has not been required in rehabilitation counseling programs (Noll et al., 2006). Several futurism articles have cited the importance of assistive technology in the rehabilitation process. A study examining the status of assistive technology training in rehabilitation counselor training programs revealed that assistive technology knowledge was seen as important or very important by the 47 respondents; however,

the majority of respondents reported that assistive technology was infused across the curriculum and not taught in a dedicated course or courses (Estrada- Hernandez, Wheaton, Dawson, & Krispinsky, 2007).

Rehabilitation counselors have identified a variety of needs for the future. These needs included (a) greater efforts in credentialing and licensure to improve professional image and employment prospects; (b) training in assistive technology, technology in the workplace, ethics, and the medical, psychiatric, psychosocial, and mental health aspects of disabilities; and (c) skill development in work with more complex consumers (Barros-Bailey, Benshoff, & Fischer., 2009).

Statement of the Problem

The Assistive Technology Act mandates increased access to AT/RT services and equipment (Assistive Technology Act of 2004). At this time, VR professionals are the primary source of vocational services for people with disabilities. As such, one responsibility of VR counselors is to facilitate the access and use of AT/RT for the consumers they serve. Having the necessary confidence of AT/RT and skills to work through a systematic selection process are critical to successful consumer employment outcomes. The focus of this research is the lack of information related to VR counselors' (1) demographic information, (2) confidence in their ability to identify and provide AT/RT services and equipment, (3) perceptions of AT/RT, and (4) perceptions of their AT/RT training needs. Outcomes of AT/RT use are important indicators of the quality service delivery process. From the perspective of consumers and rehabilitation providers, equally or more importantly, is the ability to create an optimal match of person and technology at the outset to involve the consumer in AT/RT selection.

Need for the Study

Vocational Rehabilitation (VR) counselors are not providing individuals with the most significant disabilities with adequate AT/RT (Gamble et al., 2006). Rehabilitation professionals have identified AT/RT as an area in which more training is needed, and the provision of AT/RT education will likely lead to more effective rehabilitation counseling services and outcomes (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007). Results of this study may help to close the gap between counselor confidence of AT/RT and appropriate AT/RT services and equipment that can help individuals to obtain gainful employment therefore, research is needed to assess VR counselors' baseline confidence of AT/RT in order to develop training programs about AT/RT services and equipment to better serve individuals with the most significant disabilities.

Purpose of the Study

The purpose of this study was to identify VR counselors' confidence levels in performing AT/RT responsibilities as part of their counselor role in identifying and providing AT/RT services and equipment, counselor perceptions of AT/RT, and counselor perceptions of AT/RT training needs. To ensure effective VR outcomes, it is critical to take into consideration AT/RT needs for individuals with disabilities before evaluating career options (Gamble et al., 2006). Without AT/RT, consumers may miss opportunities in certain careers; whereas, with AT/RT, on-the-job success is more likely possible. Specifically, the purpose of this study was delineated by the following research questions.

Research Questions

1. What are the demographic characteristics of the participants in this study, based on age group, gender, ethnicity, level of education, CRC eligibility, number of years as a VR counselor, and populations served?
2. What kinds of AT/RT training have VR counselors completed?
3. How often are AT/RT services purchased and provided by a VR counselor?
4. What types of AT/RT equipment were purchased by VR counselors over the last 12 months?
5. To what extent are VR counselors confident in their ability to identify and provide AT/RT services and equipment based on their perception of their role in identifying and providing AT/RT services and equipment?
6. To what extent is there a difference in VR counselor perceptions of confidence in identifying and providing AT/RT services based on gender?

Statement of the Hypotheses

Ho: 1 There is no statistically significant difference in counselor confidence in identifying and providing AT/RT services for counselors who perceive AT/RT as part of their role and those who do not.

Ho: 2 There is no statistically significant difference in vocational rehabilitation counselors' perception of confidence in identifying and providing AT/RT services based on gender.

Definition of the Terms

The following section provides definitions to increase the understanding of certain terms used throughout this study.

Assistive Technology Equipment (AT): 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 functional capabilities of individuals with disabilities (P.L. 100-407).

Assistive Technology Professional (ATP): A service provider who has earned national certification from the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), a professional organization that promotes the health and wellbeing of persons with disabilities through technology (RESNA, 2014). ATPs analyze the technology needs and assist with the selection and use of adaptive equipment for individuals with disabilities. ATPs work with clients of all ages with cognitive, physical, and sensory disabilities. The solutions provided whether low- or high-tech, are usually designed to enhance communication, mobility and access to computers and educational materials.

Assistive Technology Service: A service that directly assists an individual with a disability in the selection, acquisition, or use of assistive technology device. This term includes: (A) the evaluation of the needs of an individual with a disability, including a functional evaluation of the individual in the individual's customary environment; (B) purchasing, leasing or otherwise providing for the acquisition of assistive technology equipment by individuals with disabilities; (C) selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing of assistive technology equipment; (D) coordinating and using other therapies, interventions or services with assistive technology equipment, such as those associated

with existing education and rehabilitation plans and programs; (E) training or technical assistance for an individual with disabilities, or, where appropriate, the family of an individual with disabilities; and (F) training or technical assistance for professionals (including individuals providing education and rehabilitation services), employers, or other individuals who provide services to, employ, or are otherwise substantially involved in major life functions of individuals with disabilities (P.L. 100-407).

Individual with a Disability: Any individual: (A) who is considered to have a disability or handicap [sic] for the purpose of any federal law; and (B) who is or would be enabled by assistive equipment or assistive technology services to maintain a level of functioning or to achieve a greater level of functioning in any major life activity (P.L. 100-407).

Rehabilitation Technology: A systematic application of technologies, engineering methodologies, or scientific principles to meet the needs of and address the barriers confronted by individuals with disabilities in areas that include education, rehabilitation, employment, transportation, independent living, and recreation. The term includes rehabilitation engineering, assistive technology equipment and assistive technology services (P.L. 102- 569).

Significant Disability: An individual who has a significant physical or mental impairment which seriously limits one or more functional capacities (such as mobility, communication, self-care, self-direction, interpersonal skills, work tolerance, or work skills) in terms of an employment outcome, whose vocational rehabilitation (VR) can be expected to require multiple VR services over an extended period, and who has one or more listed physical or mental disabilities or another disability or combination of disabilities determined on the basis of an assessment for determining eligibility and VR needs to cause comparable substantial functional limitation (Martin, 2001).

Vocational Rehabilitation Counselor: Professionals who assist individuals with physical, mental, developmental, cognitive, and emotional disabilities to achieve their personal, career and independent living goals in the most integrated setting possible. They engage in a counseling process that includes communication, goal setting, beneficial growth or change through self-advocacy, psychological, vocational, and social and behavioral interventions. Vocational rehabilitation counselors utilize many different techniques and modalities, including assessment, diagnosis and treatment planning, counseling, case management, and advocacy to modify environmental and attitudinal barriers, placement-related services and utilization of rehabilitation technology (CRCC, 2014).

Vocational Rehabilitation Services: Services provided by VR that aid or assist individuals with disabilities achieve independence through employment. VR services provide specialized employment, and education related services and training to assist individuals with disabilities in becoming employed. The types of services available through VR are as varied as the people served and are designed specifically to meet the needs of each individual. VR services include: educational services; vocational assessment, evaluation and counseling; job training; assistive technology; orientation and mobility training; and job placement. To be eligible for VR services, individuals must have a physical or mental impairment that is a substantial impediment to employment and must be able to benefit from services in terms of achieving their career or vocation. VR services assist eligible individuals with mental and/or physical disabilities prepare for, secure, retain or regain employment. Vocational Rehabilitation Services are administered in compliance with the Federal Rehabilitation Act of 1973 as amended (P.L. 93-112)

Assumptions of the Study

The following assumptions apply to this study.

1. Vocational rehabilitation counselors will answer truthfully and accurately on the demographic professional profile questionnaire.

2. Vocational rehabilitation counselors will respond honestly to the *Rehabilitation Technology Counselor Survey* (RTCS) based on their knowledge and personal experiences with AT/RT.

3. The RTCS is an appropriate, valid, and reliable instrument to access VR counselor knowledge and perceptions of AT/RT.

Limitations of the Study

The following limitations may have an effect on the results of the study.

1. This study will be limited to the population of VR counselors from one state VR service agency in the southeastern part of the United States, which may limit the generalizability of the results.

2. The results will be limited to the extent that the research instrument measures counselor confidence and perceptions of AT/RT services and equipment.

3. The results of this study will be limited to an adequate return of completed and useable questionnaires.

Despite these limitations, the results of this study may provide a foundation of data for further research with VR counselors providing AT/RT services and equipment to individuals with significant disabilities.

Significance of the Study

The results of this study may be used as baseline information to identify the level of confidence and perceptions of new and experienced VR counselors related to their ability to identify and provide AT/RT services and equipment. Identifying such confidence and perceptions may lead to the development of appropriate AT/RT education and training of VR counselors. In turn, such training of counselors could impact individuals with significant disabilities to obtain the AT/RT services and equipment they need to be successful in the primary labor market. More research on continuing education and technology awareness of AT/RT is needed in order to increase opportunities for employment of individuals with significant disabilities (Gamble et al., 2006).

Summary

The study examined the confidence that VR counselors have regarding AT/RT services and equipment. The researcher collected demographic information of VR counselors working for a state VR agency in the southeast region of the United States. The use of AT/RT has been shown to enhance the ability of individuals with significant disabilities and to assist them in performing jobs that could be excessively difficult without the aid of AT/RT services and equipment. The impact of AT/RT has been demonstrated for people with diverse functional limitations (e.g., limitations resulting from Cerebral Palsy, Spinal Bifida, Multiple Sclerosis, Learning Disability, Traumatic Brain Injury) across a variety of jobs. While AT/RT can be an important part of the rehabilitation plan for individuals with significant disabilities, AT/RT may not be effective if applied inappropriately (Gamble et al., 2006). Developing and implementing effective AT/RT education and training is imperative for VR counselors to have appropriate

knowledge about AT/RT and how to provide it to their consumers with significant disabilities. Providing VR counselors with the Rehabilitation Technology Counselor Survey (RTCS) can help assess the confidence they need to provide effective AT/RT services and equipment. Proper AT/RT training could increase successful closures for individuals with the significant disabilities, placing them into employment opportunities in the primary labor market. Employment in the primary labor market is characterized as jobs that compensate or have the capacity to compensate beyond minimum wage, and have benefits and a career track. (Hagner, 2000).

CHAPTER 2: REVIEW OF LITERATURE

The primary focus of this review of the literature is to examine and determine the utilization of AT in rehabilitation. The research will focus on rehabilitation counselors. This literature review examines (a) definition of significant disability, (b) historical review of AT, (c) legislation impacting AT, (d) types of AT, (e) research studies on the barriers to using AT, (f) research studies on the impact of using AT.

Approximately 56.7 million people (18.7 percent) of the 303.9 million in the civilian non-institutionalized population of the United States had a disability in 2010. About 38.3 million people (12.6 percent) had a severe [sic] disability (Brault, 2012).

The American Community Survey (ACS) began in the early 1990's as a vision for continuous measurement of the U.S. population and to reduce the scope, cost, and complexity of the decennial census. The ACS would replace the Census "long-form" (sample survey) and allow the decennial count to focus on "a basic headcount and minimal demographic data." This vision became a reality with the 2010 Census. In 1999, the ACS adopted the disability questions being developed for the Census 2000 sample survey. Those questions were modified slightly in 2003 and then again in 2008. The questions introduced in 2008 are the questions found in the current ACS questionnaire. They cover six topics related to daily living, including hearing, vision, cognitive, ambulatory, self-care, and independent living. Respondents who report a difficulty on any of the six topics related to daily living were considered to have a disability (Erickson, Lee, & Schrader, 2013).

In the year 2011, an estimated 2.0 percent (plus or minus 0.03 percentage points) of non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a

hearing disability. In other words, 4,087,400 out of 202,214,600 non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a hearing disability.

An estimated 1.7 percent (plus or minus 3.29 percentage points) of non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a visual disability. In other words, 3,447,800 out of 202,214,600 non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a visual disability.

An estimated 4.2 percent (plus or minus 0.04 percentage points) of non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a cognitive disability. In other words, 8,546,000 out of 202,214,600 non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a cognitive disability.

An estimated 5.0 percent (plus or minus 0.04 percentage points) of non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported an ambulatory disability. In other words, 10,153,100 out of 202,214,600 non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported an ambulatory disability.

An estimated 1.8 percent (plus or minus 3.29 percentage points) of non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a self-care disability. In other words, 3,694,800 out of 202,214,600 non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported a self-care disability.

An estimated 3.5 percent (plus or minus 0.04 percentage points) of non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported an independent living disability. In other words, 7,108,000 out of 202,214,600 non-institutionalized individuals with ages ranging from 16 to 64 in the United States reported an independent living disability. The

estimates above are based on a sample of 1,943,909 persons who participated in the 2011 ACS (Erickson, Lee, & Schrader, 2013).

Dawn Carlson and Nat Ehrlich conducted a survey in 2001 to measure the AT and Information Technology used by persons with disabilities in the United States in 2001. The following are the results:

- 8.3 million Americans with disabilities needed special equipment, aids, or AT to perform basic activities of daily living (ADLs) such as bathing or showering, dressing, eating, getting in and out of bed or chairs, walking, getting outside, and using the toilet, including getting to the toilet.
- 15.4 million Americans with disabilities reported using AT devices or technologies (primarily medical), such as tracheotomy tubes, ostomy bags, catheterization equipment, glucose monitors, diabetic equipment and supplies, inhalers, nebulizers, hearing aids, crutches, canes, walkers, wheelchairs, scooters, and feeding tubes.
- 16.6 million Americans with disabilities used special equipment, aids, or AT.
- 7.4 million Americans with disabilities had surgical implants such as shunts to drain away fluid, artificial joints, implanted lenses, pins, screws, nails, wires, rods, or plates, artificial heart valves, pacemakers, silicone implants, infusion pumps, implanted catheters, organ implants, and cochlear implants (Carlson, & Ehrlich, 2005).
- 14 million Americans with disabilities lived in homes modified to meet their special needs.
- 1 million persons with disabilities who did not have any home modifications indicated that they needed such accommodations (Carlson, & Ehrlich, 2005).

- 511,000 Americans with disabilities reported using modified cars or vans.
- 369,000 persons with disabilities reported needing modifications to their cars or vans.
- 15.1 million Americans with disabilities worked at the time of the interview. In this group, 4.2 million individuals reported being limited in the kind or amount of work they could do.
- 714,000 Americans with disabilities reported having an accessible work environment that included hand rails or ramps, accessible parking or an accessible transportation stop close to the building, elevators, including elevators designed for persons with special needs, specially-adapted work stations, restrooms designed for persons with special needs, automatic doors, voice synthesizers, TDDs, infrared systems or other technical devices, Braille, enlarged print, special lighting or audio tape devices, and special pens or pencils, chairs, or other office supplies.
- 1.3 million Americans with disabilities working at the time of the interview reported needing one or more of the above-mentioned work place designs and accessories (Carlson, & Ehrlich, 2005).
- 402,000 Americans with disabilities were provided with special accommodations that included readers, oral and sign language interpreters, job coaches, personal assistants, job redesign or slowing the pace of tasks, reduced work hours and more breaks, part-time work, and other types of equipment.
- 531,000 Americans with disabilities, working at the time of the interview, indicated a need for one or more of the previously-mentioned special accommodations (Carlson, & Ehrlich, 2005).

Definition of Significant Disability

According to the federal policy framework, an individual with a significant disability means an individual who has a significant physical or mental impairment which seriously limits one or more functional capacities (such as mobility, communication, self-care, self-direction, interpersonal skills, work tolerance, or work skills) in terms of an employment outcome, whose vocational rehabilitation can be expected to require multiple vocational rehabilitation services over an extended period of time, and who has one or more listed physical or mental disabilities or another disability or combination of disabilities determined on the basis of an assessment for determining eligibility and vocational rehabilitation needs to cause comparable substantial functional limitation (P.L. 93-112).

Individuals with disabilities, including individuals with significant disabilities, have demonstrated their ability to achieve gainful employment in integrated settings if appropriate services and supports are provided. The provision of vocational rehabilitation services can enable individuals with disabilities, including individuals with significant disabilities, to pursue meaningful careers by securing gainful employment commensurate with their abilities and capabilities (Gandy, Martin, & Hardy,1999).

In keeping with the Rehabilitation Act of 1973 as amended, Florida's definition and criteria for Significant Disability will be an individual with a disability which (a) seriously limits three (3) or more functional capacities in terms of work, (b) requires three or more primary services, (c) services must be provided over an extended period of time (at least 12 months), and (d) is not likely to be corrected through surgical intervention and/or other treatment modes (Florida Division of Vocational Rehabilitation).

Although individuals with significant disabilities have the potential to make contributions through employment, the vast majority do not have access to integrated jobs. In many instances individuals need access to employment supports. Most individuals with significant disabilities continue to be isolated and segregated in day activity centers and sheltered workshops or are unemployed and unserved on waiting lists. If individuals with significant disabilities are to achieve full participation and inclusion in society, employment is the most defining aspect of that status. Employment should be an expected life activity for individuals with significant disabilities and they should not be forced into a decision of whether or not to work as an aspect of self-determination.

When state VR agencies serve individuals with significant disabilities, they invest in ensuring this population is successful in employment. One can easily agree with Martin in his summarization of the treatment of individuals with significant disabilities (Martin, 2007 p.26, p.46, p.71, p. 94; Martin, 2001 p.86, p. 135).

- The area of vocational rehabilitation is just now undergoing the revolution in thinking that occurred in residential services and education a decade or so ago. For the past 20 or more years, sheltered workshops have served as the primary site for vocational training for people with significant disabilities. In recent years, segregated day treatment and training programs have been established for people deemed too 'disabled' [sic] to function even in sheltered workshops;
- All citizens with disabilities deserve equal opportunity for self-determination, family, and equal access to recreation, school, vocational and technical training, housing, and medical care. If one takes a look at the funds allocated annually for the support of these citizens,

one quickly learns that those with disabilities, particularly significant disabilities, have not always been included.

- Significant disabilities (a change in terminology from the qualifier "severe" [sic] to "significant"). Presumably, persons receiving Social Security Disability Insurance (SSDI) and Supplemental Security Insurance (SSI) benefits who desire an employment outcome are eligible to receive VR services without going through an eligibility process;
- Of significance is the fact that VR services are targeted toward serving individuals who are considered those with significant disabilities. When considering degree or level of disability, some students who have benefited from special education may not be considered to meet the criterion of ‘significant disability’ to be eligible for VR services;
- Persons who have significant disabilities (e.g., blindness, cerebral palsy, mental retardation [sic], paraplegia) will vary in his or her reaction(s) to the disability. The perception of severity among others (for instance, parents, siblings, loved ones, friends, work and school mates) will, as well, vary considerably. The effect of paraplegia for one person, for example, may be completely devastating and for another be relatively insignificant. These two extremes certainly do not characterize all persons who have a paralysis disability. The majority of persons with disabilities' reaction will probably fall somewhere between these two extremes;
- Eligibility criteria, as well as VR resources, continue to expand. The strong emphasis existent today on serving persons with significant disabilities has made it possible to serve persons who were previously denied service because of the severity of his or her disability;

- Advances in medical knowledge and treatment, and the availability and utilization of rehabilitation engineering and assistive technology, have increased the ability of persons with significant disabilities to secure employment.

Historical Review of Assistive Technology

Like all fields of study, AT has a history from which it has evolved and that changes dramatically on a steady and regular basis. For the sake of chronological convenience, Bryant and Bryant (2012) looked at the history of AT in three periods: (a) that which occurred prior to 1900, which they called the Foundation Period; (b) that which occurred from 1900 through 1972, which they term the Establishment Period; and (c) the years from 1973 to the present, which they call the Empowerment Period. Some of the information, such as the invention of a particular AT device, has a direct connection for AT use. Other significant events, such as the opening of special schools or the beginning of a periodical, have an indirect connection to AT, either as a venue or an opportunity for AT service delivery or as a means to disseminate information pertaining to AT use (Bryant & Bryant, 2012).

Foundation Period: Pre-1900s

In their excellent text titled, *Assistive Technologies: Principles and Practices*, Cook and Hussey (2002) recounted the fictional case of Borg, a Stone Age resident who broke his leg on a hunting trip. The authors make the point that, for all intents and purposes, AT began with man's attempt to "make do" after a debilitating injury, whether temporary or permanent. In Borg's case, his leg healed improperly, leaving him with a noticeable limp. Reaching down, he found a stick, which he cut to a proper length and used to help him walk more easily. Certainly the stick fits the definition of an AT device in that it was a customized item that helped him to maintain one of his functional capabilities. One can easily agree with Cook and Hussey's (2002) assertion

that AT devices existed as soon as human beings began making things to help them adapt to the functional limitations imposed by disabilities, whether those disabilities were acquired or congenital.

Assistive Technology development paralleled the disability field and history indications that adaptations of some kind were needed as far back as 1000 B.C., when speech and language difficulties were first recorded. One of the earliest incidences of acquired learning disabilities can be tethnicityd to A.D. 33, when Mecurial reported the case of a man losing his memory after being hit on the head with an ax during a skirmish. We also know that the first recorded spinal surgery occurred around A.D. 600, providing evidence that individuals existed with acquired physical conditions that undoubtedly required postsurgical adaptations for improving functional limitations (Bryant & Bryant, 2012).

The AT may have been as simple as feeding utensils or as complex as specially-designed wheeled mobility mechanisms. Further examination of historical accounts show autopsies being performed on deceased veterans in the 1600s and 1700s to examine causal factors for physical and mental conditions (Cook & Hussey, 2002). And, of course, there are literary accounts of seafarers with wooden legs and hooks continuing to go to sea long after injuries caused the loss of extremities. There is little doubt that human ingenuity helped such people perform their tasks in a way that would keep them of value to their crewmates and profession.

The 1800s began a period of service for individuals with disabilities that has continued to this day and laid the foundation for disability services as we know them. During this century, in 1817, Thomas Hopkins Gallaudet opened his school for students who were deaf. The name of the school, the American Asylum for Education of the Deaf and Dumb [sic], later the American School for the Deaf, indicates how terminology has changed over the last 200 years. Twelve

years later, a Frenchman named Louis Braille introduced an adaptation of embossed code so that people who were blind could decode the printed word. In 1834, he perfected the literary code that bears his name. At about the same time, Dr. J. G. Blomer established an institute for people with physical disabilities where he maintained a workroom for devising apparatus, bandages, and artificial limbs, all of which were early AT devices (Bryant & Bryant, 2012).

In 1836, Taylor devised what was thought to be the first tangible math apparatus that could be used by individuals who were blind. *The American Annals of the Deaf* was first published in 1847, followed a year later by the opening of the first residential institution for people with intellectual disabilities (the Perkins Institution in Boston). The end of the 19th century found several significant events that indirectly affected AT by benefiting individuals with disabilities. The first occurred in 1855, when Kentucky set up a printing house for people who were blind, which several years later was incorporated as the American Printing House for the Blind. In 1860, the *Gallaudet Guide and Deaf Mute's* [sic] *Companion* became the first publication written especially for people with disabilities. Four years later, in 1864, Gallaudet University was founded as the National Deaf Mute [sic] College (Smith, 1996).

In 1869, a patent was filed for the basic design of the manual wheelchair in use to this day. The wheelchair had been introduced in the United States during the Civil War, when wooden chairs and wooden wheels provided mobility for soldiers who had legs amputated. In 1877, Thomas Edison invented the phonograph, a significant event for those who would later benefit from learning through listening to material on recordings. Then, in 1884, the Home of the Merciful Savior opened its doors in Philadelphia to children with physical disabilities. Finally, in 1892, Frank Hall invented the Braille typewriter. To summarize the Foundation

Period from the perspective of the 21st century, one sees small steps occurring in the disabilities field that led the way for major breakthroughs in the 20th century (Pelka, 1997).

Establishment Period: 1900–1972

The Establishment Period was from 1900 through 1972 because these years established the disability disciplines as specific entities, and the policies, laws, and litigation that were established in an era of gains for people with disabilities, their families, and advocates. Throughout this period, educational, scientific, and psychological advances were made concerning the causes, preventions, and ramifications of disabilities. In addition, people's viewpoints concerning disabilities and the capabilities of people with disabilities changed dramatically during these years. Devices and techniques were developed to help people with disabilities utilize their strengths to compensate for their limitations (Bryant & Bryant, 2012).

In addition, legal and procedural barriers that discriminated against people seen as "different" were addressed. Finally, organizations such as the currently-named Council for Exceptional Children, American Speech-Language-Hearing Association, American Association of Intellectual and Developmental Disabilities, Easter Seals, United Cerebral Palsy, the ARC, and Learning Disability Association of America were formed to advocate for people with disabilities and the professionals and families associated with the disability movement. These organizations and events led to the rapid development of AT devices and services, years before those terms officially existed (Pelka, 1997).

The Foundation Period also shows the impact that war had on disabilities; that is, battles led to injuries that led to physical, language, sensory, and cognitive conditions. Shortly after World War I, the United States Congress recognized the results of battle-caused disabilities when it passed the Soldier Rehabilitation Act (also known as the Smith-Sears Veterans Rehabilitation

Act) in 1918. This significant legislation was intended to help veterans with disabilities resume life, post-disability, and included the first vocational rehabilitation provision. The work of people like Kurt Goldstein and other injured veterans stimulated service delivery and enhancement and brought a focus on people who had served their country and who now needed their countrymen's assistance to reenter American life. Two years later, the Smith-Fess Citizens Vocational Rehabilitation Act was passed, extending vocational rehabilitation services to nonveterans whose challenges were similar to their military counterparts (Bryant & Bryant, 2012).

Funds were provided for vocational guidance, training, job adjustment, prostheses, and placement services. Clearly, recognition of functional capabilities and people's assets became the rule rather than the exception; rehabilitation professionals focused on using techniques and devices to help people compensate for their functional limitations. Not surprisingly, this new focus brought about a new emphasis on compensatory strategies and equipment that would change the face of disabilities forever (Bryant & Bryant, 2012).

In 1920 Barr, Stroud, and Fournier d'Albe patented the first reading machine, the Optophone, for use by people who were blind. Three years later, Barr and colleagues expanded their apparatus to deal with the increased demands for their services. By the end of the decade, guide dogs had been introduced to America, providing mobility independence potential to people who were blind. Breakthroughs in blindness continued, including the National Institute for the Blind's introduction of a high-speed rotary press for embossed type and the Library of Congress' 1931 decision to distribute Braille reading materials under its auspices. In 1933, the American Printing House for the Blind adopted Standard English Braille Grade 2 for junior and senior high school textbooks. A few years later, the first talking books on long-playing records were

produced and disseminated. By 1936, the American Printing House for the Blind had produced and disseminated its first recorded material (Bryant & Bryant, 2012).

The passage of the Social Security Act in 1935 provided, among other things, grants to states for assisting (a) individuals who were blind, and (b) children with disabilities. In 1937 the X-frame folding wheelchair by Herbert A. Everest and Harry C. Jennings was patented. The 1940s continued to see service delivery breakthroughs, as the United States military began providing its members with speech and hearing services (Bryant & Bryant, 2012).

The year 1947 brought about the introduction of the Hoover cane, which was developed as part of a comprehensive approach to orientation and mobility training that was known as the "touch cane technique" and was designed in part to assist veterans who became blind during World War II. It also saw the development of battery-operated hearing aids, but their bulk presented great difficulty in their use. The 1950s further developed improvements in communication and educational skills for people who were blind. The initial contribution occurred in 1951 with the availability of the Perkins Brailler, a device still in use today (Sauberger, 1996).

The year 1952 saw the introduction of the Tellatouch communication device for people who were both deaf and blind. Computerized Braille was first demonstrated in 1955, and the following year the American Printing House for the Blind first made materials available for day school students. The year 1965 saw the establishment of the National Commission on Architectural Barriers, which led to the passage of the Architectural Barriers Act of 1986. The laser cane, which emitted a beam of light to detect objects deterring unobstructed movement, was invented in 1966 and helped people receive advanced notice of obstacles and detect items that were not detected by a traditional white cane. Shortly thereafter, in 1971, the OPTACON was

marketed as another tool to allow people who were blind to read text. In that same year, the first Braille Vision Books were produced, which contained one page for Braille next to a page of traditional print (Bryant & Bryant, 2012).

To summarize, the Establishment Period was a time of action on behalf of people with disabilities. World Wars I and II, Korea, and Vietnam had created a new group of Americans with disabilities who were reentering the postwar society with various needs. Advances in medicine were allowing children to live through disease and birth difficulties at a rate unimagined at the turn of the century. People with the entire spectrum of disabilities were becoming a larger percentage of the United States population, and their respective needs were beginning to be addressed by technology in order that they were afforded the right to live the American Dream as did their fellow citizens without disabilities.

Inventions and innovations were helping people use their functional strengths to reduce the impact of their functional weaknesses, and people with disabilities were entering the workforce in record numbers. The disability rights movement was beginning to be recognized as a social and political force. Organizations had been established that pressed for new legislation and policies in education and employment. AT devices and services were being devised and utilized at unprecedented rates. It was truly an exciting time but again, to paraphrase a familiar quotation: “We hadn’t seen anything yet.” Beginning in 1973, the disability rights movement was to begin an unprecedented run that continues to this day (Bryant & Bryant, 2012).

Empowerment Period: 1973 to Present

The Empowerment Period was described as the period that provided people with disabilities and their supporters the ability and legal authority to continue their legitimate pursuit of the American Dream. The year 1973 was selected as the beginning of this period because it

was the year the Rehabilitation Act was amended to include Section 504, which for the first time made it formal United States policy that discrimination against people with disabilities would not be tolerated. Specifically, Section 504 stated that anyone receiving federal dollars could not discriminate against an individual because of his or her disability. Sadly, this landmark legislation was not implemented until 1977, after a sit-in at the Secretary of State's office. Partially as a result of this activism, disability rights became recognized as a civil rights issue, a distinction that has remained to this day to be the driving force behind disability advocacy in education, housing, employment, and all other facets of life. Thus, Section 504 is considered as significant civil rights legislation that ushered in the Empowerment Period (Bryant & Bryant, 2012).

The year 1974 introduced the development of the closed-circuit television (CCTV) for the electronic magnification of print, and the first compact Braille electronic calculator was developed. In the following year, an early version of the speech synthesizer was developed and the first talking calculator with audio and visual output was introduced. In 1976, the Kurzweil Reading Machine gave people who were blind the opportunity to access text, but it was so costly that few could afford the technology at the time. During the four years between 1976 and 1979, the Option dissemination project saw that device used with increasing frequency. Grants became available to provide adaptive equipment to classrooms and concurrent training to classroom teachers. Versa Braille was introduced in 1978, followed by the View Scan. The first Braille embosser connected to a microcomputer was introduced in 1979, dramatically increasing the availability of Braille text to children and adults. At the same time, IBM operated its special needs unit, which led the way in developing and adapting technology for people with disabilities (Bryant & Bryant, 2012).

With the passage of the Technology-Related Assistance for Individuals with Disabilities Act of 1988, Congress acknowledged the potential of AT to assist persons with disabilities to access the "American Dream." The overall purpose of the Tech Act was to provide financial assistance to states in order to help them develop consumer-responsive, cross-age, and cross-disability programs of technology-related assistance. The passage of the Americans with Disabilities Act in 1990 continued the string of legislation passed on behalf of people with disabilities by extending the principles of Section 504 to all sectors of the United States, public and private. Although assistive technology has been viewed historically as beneficial to individuals with physical and sensory impairments, there has been an increased focus on technology for people with all types of disabilities in recent years (Bryant & Bryant, 2012)

Federal Legislation Impacting Assistive Technology

The Rehabilitation Act of 1973 (P.L. 93-112)

The purpose of this Act was to provide a basis for the Rehabilitation Service Administration to establish within the Department of Health, Education and Welfare an office for people with disabilities, and to authorize specified programs. The Act has five titles, which define the terms used in the Act:

- **Title I: Vocational Rehabilitation Services.** The purpose of this title was to authorize grants to assist States in meeting the current and future needs of individuals with disabilities, so that they may prepare for and engage in gainful employment. The Act authorized $6.5 billion for fiscal year 1974 and $6.8 billion for fiscal year 1975 in order to make grants available to states to assist them with the costs of vocational rehabilitation services. It insured that individuals with a disability would be involved in the

development of their plan along with the vocational rehabilitation counselor or coordinator;

The law defined vocational rehabilitation services as any goods or services necessary to render a person with a disability employable, including, but not limited to evaluation of rehabilitation potential; counseling, guidance, referral, and placement services; vocational and training services; physical and mental restoration services; maintenance, not exceeding the estimated cost of subsistence, during rehabilitation; interpreter services for the deaf and reader services for the blind; recruitment and training services; rehabilitation teaching services and orientation and mobility services for the blind; occupational licenses, tools, equipment, and initial stocks and supplies; transportation in connection with the rendering of any vocational rehabilitation services; and telecommunications, sensory, and technological aids.

- **Title II: Research and Training.** This title authorized assistance to State and public or nonprofit agencies to plan and conduct research, demonstrations, and related activities in the vocational rehabilitation of individuals with disabilities and to train rehabilitation personnel;
- **Title III: Special Federal Responsibilities.** This title authorized the Secretary of Health, Education, and Welfare to make grants to States and public or nonprofit agencies and organizations for paying part of the cost for construction of rehabilitation facilities, initial staffing and planning assistance. It authorized payments of such sums as may be necessary for fiscal years 1974 and 1975;
- **Title IV: Administration and Program and Project Evaluation**. It set forth the functions of the Commissioner in carrying out his duties under this Act. It authorized the

Secretary to conduct studies, investigations and evaluations of programs authorized by this Act;

- **Title V: Miscellaneous**. This title provided for the repeal of the Vocational Rehabilitation Act.

The Rehabilitation Act of 1973 Amendment Section 504 (P.L. 93-112)

The passage of the 1973 Rehabilitation Act (P.L. 93-112) was, perhaps, one of the most significant events of the twentieth century; in particular, the effect and impact that Section 504 would have upon American society and for the rights of persons with disabilities. The major focus of the 1973 Rehabilitation Act dealt with equality of opportunity through provisions relating to (a) consumer involvement, (b) emphasis on persons with severe disabilities, (c) creation of the now-named National Institute on Disability and Rehabilitation Research (NIDRR), (d) emphasis on program evaluation, and (e) the advancement of the civil rights of persons with disabilities (Martin, 2007 p.8). The 1973 Rehabilitation Act represented a mandate to serve persons with severe [sic] disabilities. Section 504 is a federal law designed to protect the rights of individuals with disabilities in programs and activities that receive Federal financial assistance from the U.S. Department of Education (ED). Section 504 provided: "No otherwise qualified individual with a disability in the United States shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." (U.S. Department of Education, 2008).

The Education for All Handicapped Children Act of 1975 (P.L. 94-142)

Prior to the passage of PL 94-142, the Education for All Handicapped Children Act of 1975, children with disabilities-particularly those with significant disabilities-had few programs

that were designed to accommodate instructional needs that differed from the mainstream. Parents and parent-based groups, the National Association of Retarded [sic] Children, and the Council for Exceptional Children lobbied the federal government for programs to educate children with disabilities (Gandy, Martin, & Hardy,1999).

The Education for All Handicapped [sic] Children Act (P. L. 94-142) was legislation passed by the United States Congress and signed into law by President Gerald R. Ford on November 29, 1975. The purpose of the Education for All Handicapped [sic] Children Act was to guarantee the availability of special education programming required by children and youth with disabilities. It assured fairness and appropriateness in decision-making with regard to providing special education to children and youth with disabilities. It provided financial assistance to states and local governments through the use of federal funds. The Act defined children as having a disability if they were individuals with an intellectual disability, hard of hearing, deaf, orthopedically impaired, other health impaired, speech impaired, visually impaired, seriously emotionally disturbed, or children with specific learning disabilities who by reason thereof require special education and related services (Ballard & Zettel, 1977).

The Act has six key mandates outlined which served as the guiding principle in serving students with disabilities. States receiving federal funds were required to comply with the federal mandates which included a free appropriate public education, nondiscriminatory identification and evaluation, individual education program, least restrictive environment, due process, and parental participation (Ballard & Zettel, 1977).

The Technology-Related Assistance for Individuals with Disabilities Act of 1988 (P.L. 100-407)

Technology-Related Assistance for Individuals with Disabilities Act of 1988 was the first Act that defined AT Devices and Services and promoted the availability and quality of AT devices and services to all individuals with disabilities. The Tech Act of 1988 has two titles.

Title I provided grants to States to support a consumer-responsive comprehensive statewide programs of technology-related assistance for individuals with disabilities. It required each State that received funding under this title to submit an annual report. It evaluated the extent to which states receiving funds were making significant progress, and subjected states which failed to comply with the requirements to a corrective action plan.

Title II developed programs of national significance. In Part A of title II the National Council would conduct a study on financing AT Devices and AT Services for individuals with disabilities. It required the national council to conduct a study and make recommendations to Congress and the President concerning the technology-related assistance, devices, and services and appoint an advisory committee in accordance with the Rehabilitation Act of 1973 to assist the Council in carrying out the Council's duties.

Part B of the Act established a National Information and Program Referral Network. It directed the national information and referral network to assist States regarding technology-related assistance. It conducted a study of the feasibility and desirability of determining the appropriate structure for the network.

Part C of the Act provided training and public awareness projects. It provided grants to assist institutions of higher education to prepare personnel for careers relating to the provision of technology-related assistance. It provided funding to carry out national projects that built

awareness of the importance and efficacy of AT devices and services for individuals of all ages with disabilities functioning in various settings of daily life.

Part D of the Act established demonstration and innovation projects. It provided funding to pay all or part of the cost of demonstration and innovation projects concerning technology-related assistance for individuals with disabilities.

Part E of the Act authorized appropriations for FY 1989 through 1993. This was dependent on specified levels of appropriations (P.L. 100-407).

Individuals with Disabilities Education Act of 1990 (P.L. 101-476)

In 1990, PL 101-476 amended the Education of the Handicapped [sic] Act to change references to handicapped [sic] individuals or children. It referred to them as individuals or children with disabilities. It extended coverage to children with disabilities to include those with autism or traumatic brain injury. The Act redefined special education to include instruction conducted in the home, in hospitals, in institutions, in physical education, and in the classroom. It redefined related services to include therapeutic recreation, social work services, and rehabilitation counseling. It defined transition services, and required that the individualized education program (IEP) include a statement of needed transition services for students beginning no later than age 16 and annually thereafter (and when determined appropriate for the individual, beginning at age 14 or younger). It also defined AT devices and services.

The Act revised secondary education and transitional services for youth with disabilities to include assistance for transition to independent and community living. It developed programs for AT and services for students with disabilities as they made the transition from secondary school. And the Act funded programs that provided AT devices and services to secondary school students making the transition to vocational rehabilitation, employment, postsecondary

education, or adult services. It provided for AT, educational media, and materials for projects that increase access to AT devices and services in the education of infants, toddlers, children, and youth with disabilities (P.L. 101-476).

The Americans with Disabilities Act of 1990 (P.L. 101-336)

Perhaps the most significant event affecting people with disabilities since the 1980s was the passage of the Americans with Disabilities Act (ADA) in 1990. The ADA outlawed discrimination against people with disabilities by businesses, employers, state and local governments, transportation authorities, and other entities. In contrast to Section 504 of the Rehabilitation Act, the ADA applies to all entities whether or not they receive federal funds (Martin, 2001). The ADA's five Titles were developed with this perspective:

- **Title I, Employment.** This title stated that a business must provide reasonable accommodations to protect the rights of individuals with disabilities in all aspects of employment. Possible changes may include restructuring jobs, altering the layout of workstations, or modifying equipment. Employment aspects may include the application process, hiring, wages, benefits, and all other aspects of employment. Medical examinations are highly regulated;
- **Title II, Public Services.** Public services, which include state and local government instrumentalities, the National Railroad Passenger Corporation, and other commuter authorities, cannot deny services to people with disabilities' participation in programs or activities which are available to people without disabilities. In addition, public transportation systems, such as public transit buses, must be accessible to individuals with disabilities;

- **Title III, Public Accommodations.** All new construction and modifications must be accessible to individuals with disabilities. For existing facilities, barriers to services must be removed if readily achievable. Public accommodations include facilities such as restaurants, hotels, grocery stores, retail stores, etc., as well as privately-owned transportation systems;
- **Title IV, Telecommunications.** Telecommunications companies offering telephone service to the general public must have telephone relay service to individuals who use telecommunication devices for the deaf (TTYs) or similar devices;
- **Title V, Miscellaneous.** This Title includes a provision prohibiting either (a) coercing or threatening or (b) retaliating against the disabled [sic] or those attempting to aid people with disabilities in asserting their rights under the ADA.

  (Pub. L. 101-336)

Individuals with Disabilities Education Act Amendments of 1991 (P.L. 102-119)

The Individuals with Disabilities Education Act Amendments of 1991 (IDEA) amended the IDEA to allow states the option to include under the definition of children with disabilities, children aged 3 through 5, who needed special education and related services because they were experiencing delays in one or more of the following areas of their development: physical, cognitive, communication, social or emotional, or adaptive. It revised the definitions under provisions for early intervention services for infants and toddlers with disabilities, to include references to the following developmental needs: communication, social or emotional, and adaptive. It included early intervention services: vision services, AT devices and services, and transportation and related costs. It included qualified personnel: family therapists, orientation and mobility specialists, and pediatricians and other physicians. IDEA required that early

intervention services, to the maximum extent appropriate, be provided in natural environments, including the home, and community settings in which children without disabilities participate (P.L. 102-119).

1992 Reauthorization of the Rehabilitation Act of 1973 (P.L. 102-569)

The Rehabilitation Act Amendments of 1992 made several fundamental changes to the Rehabilitation Act Of 1973 and the way in which rehabilitation services would be provided to Americans with disabilities through the public rehabilitation program. The new law, built on the foundation of the Americans with Disabilities Act (ADA), recognized competence and choice and afforded individuals with disabilities access to the services and supports they needed to live, work, and meaningfully participate in community life. The reauthorized Act began with the assumption that people could achieve employment and other rehabilitation goals, regardless of the nature and severity of their disability, if appropriate services and supports were made available. This allowed State VR agencies to provide individuals with disabilities with increased access to the wide variety of AT devices and services that many of them needed to gain and retain employment. The technology needs of each VR client had to be addressed in the Individualized Written Rehabilitation Program by including a statement of the specific rehabilitation technology services to be provided to assist in the implementation of intermediate rehabilitation objectives and long-term rehabilitation goals for the individual (Button, 1993).

Technology-Related Assistance for Individuals with Disabilities Act Amendments of 1994 (P.L. 103-218)

This reauthorization extended Congressional support of the original legislation (P.L. 100-407) through to March 1999 and continued to support state efforts to implement consumer-

responsive, comprehensive, statewide programs of technology-related assistance for individuals with disabilities of all ages.

Title I of the new act provided the continuation of competitive grants and technical assistance to states and established information and technical assistance to individuals with disabilities. Title II provided funds for programs of national significance, including training and demonstration projects related to AT and the establishment of a national classification system for AT. Title III provided funds to states to establish and expand alternative financing mechanisms for individuals to purchase AT.

The new Tech Act legislation intended to maintain state flexibility, while focusing the efforts of the states on systemic change and advocacy activities necessary to develop a consumer-responsive, comprehensive, statewide program of technology-related assistance for individuals with disabilities that would have a long-lasting impact (Crowl & Franklin, 1994).

Telecommunications Act of 1996 (P.L.104-104)

The Federal Communications Commission (FCC) had rules requiring telecommunications equipment manufacturers and service providers to make their products and services accessible to people with disabilities, if such access is readily achievable. These rules implemented Section 255 of the Communications Act. If it was not readily achievable, Section 255 required manufacturers and service providers to make their devices and services compatible with peripheral devices and specialized equipment that were commonly used by people with disabilities, if it was readily achievable. The FCC determined that interconnected Voice over Internet Protocol (VoIP) providers complied with Section 255 (Federal Communications Commission, 2012).

Individuals with Disabilities Education Act Amendments of 1997 (P.L. 105-17)

On June 4, 1997, President William J. Clinton signed the bill reauthorizing and amending the Individuals with Disabilities Education Act (IDEA). IDEA was organized in four parts. It retained the major provisions of earlier federal laws in this area, including the assurance of having a free appropriate public education (FAPE) available to all children with disabilities, in the least restrictive environment (LRE), and the guarantee of due-process procedures and procedural safeguards. It also included modifications to the law. Some of the changes that affected special education practice nationwide included the participation of students with disabilities in state and district-wide assessment (testing) programs, with appropriate accommodations where necessary (Knoblauch & McLane, 1999).

Individuals with Disabilities Education Act had 6 programs: State improvement grants, research and innovation, personnel preparation, studies and evaluations, coordinated technical assistance/information dissemination, technology development, demonstration, and utilization/educational media services. The IDEA included parent training and information centers, information dissemination clearinghouses and resource centers, and technical assistance to build the capacity of state and local programs (Knoblauch & McLane, 1999).

Assistive Technology Act of 1998 (P.L.105-394)

This law built on its predecessor, the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Tech Act), and affirmed that technology was a valuable tool that could be used to improve the lives of Americans with disabilities. It also affirmed the federal role of promoting access to AT devices and services for individuals with disabilities.

The Assistive Technology Act of 1998 provided funding to support states efforts regarding AT. The law provided flexibility to states in responding to the AT needs of their

citizens with disabilities and built on the accomplishments achieved by states through AT programs funded under the Tech Act. Under the new Tech Act, all states and outlying areas were eligible to receive 10 years of federal funding for their state AT program. States that have completed 10 years could receive 3 additional years of federal funding (P.L. 105-394).

The Carl D. Perkins Vocational and Technical Education Act of 1998 (P.L. 105-332)

The Perkins Act defined vocational-technical education as organized educational programs offering classes directly related to preparing individuals for employment occupations requiring other than a college degree. The Department's Office of Vocational and Adult Education (OVAE) administers the Perkins Act. Under the Perkins Act, funds were made available to help provide vocational-technical education programs and services to youth and adults. Only State Boards for Vocational Education were eligible to apply for State Basic Grants. The distribution of grant funds within a state was directed to priority items established by the state in accordance with an approved state plan for vocational-technical education (U.S. Department of Education, 2002).

1998 Amendments to the Rehabilitation Act of 1973 (P.L. 105-220) focus on Section 508

Section 508 of the Rehabilitation Act, as amended in 1998 by Public Law 105-220 (the Workforce Investment Act), applied to Federal departments and agencies. Section 508 required that when Federal agencies developed, procured, maintained, or used Information and Communication Technologies (ICT), they would ensure that the technology and services allowed Federal employees and members of the public with disabilities access to and use of information and data that was comparable to that by Federal employees and members of the public who were not individuals with disabilities.

The term 'Information and Computer Technologies' included software, web-based applications, telecommunications products and call center technologies, information kiosks and transaction machines, electronic, PDF and HTML documents and forms, Internet/Intranet sites, multimedia, remote access technologies, computer-based training, mobile applications, social media, Webinar and Webcast applications, Web 2.0, and office equipment such as copiers, scanners, multifunction devices, portable media devices, fax machines, computers, and printers (U.S. Department of Labor, 1998).

No Child Left Behind Act of 2001 (P.L. 107-110)

Major features of the No Child Left Behind Act of 2001 (NCLB) included requirements to implement standards-based assessments, provide grants to states for assessment development, and require states to participate in National Assessment of Educational Progress (NAEP). NCLB directed states to annually apply adequate yearly progress (AYP) standards, incorporate a goal of all pupils reaching a proficient or higher level of achievement and it assigned a sequence of consequences that must be implemented for schools and LEAs that fail to meet AYP standards for two or more consecutive years. The law stated that all paraprofessionals were to have completed at least two years of higher education or met a "rigorous standard of quality." It initiated several new programs aimed at improving reading instruction and consolidated a state grant authorizing teacher recruitment, professional development, and hiring. Education agencies had to ensure that teachers were "highly qualified." Programs were consolidated into grants supporting integration of technology into K-12 education (P.L. 107-110)

The Individuals with Disabilities Education Improvement Act of 2004 (P.L. 108-446)

The Individuals with Disabilities Education Improvement Act of 2004 (P.L. 108-446) reauthorized the Individuals with Disabilities Education Act. It was divided into three titles.

Title I made changes to the Office of Special Education Programs, abolished state sovereign immunity, provided for the employment of individuals with disabilities, and reduced paperwork. It further mandated assistance and improved education of all children with disabilities, including infants and toddlers with disabilities.

Title II, National Center for Special Education Research, established a "Special Education Research Center," with the mission of sponsoring research to evaluate the effectiveness of the Individuals with Disabilities Education Act and expand knowledge that will improve services for infants, toddlers and children with disabilities. And Title III, Miscellaneous Provisions, amended the Children's Health Act of 2000 to include the Department of Education among the Federal agencies required to be represented in a consortium involved in a long-term child development study authorized under such Act (P.L. 108-446).

Assistive Technology Act of 2004 (P.L.108-364)

The AT Act of 2004 (P.L. 108-364), amended the AT Act of 1998 to support states to address the AT needs of individuals with disabilities. The Act awarded grants to states to maintain comprehensive statewide programs of technology-related assistance to support programs that were designed to maximize the ability of individuals with disabilities and their family members, guardians, advocates, and authorized representatives to obtain AT.

It required states to use portions of AT grant funds for state-level activities to increase access to and funding for AT devices and services, as well as for programs for device re-utilization, device loan, device demonstration, information and referral services, and public-awareness activities. It provided funding to protection and advocacy systems to assist in the acquisition, utilization, or maintenance of AT devices or AT services for individuals with disabilities. It also provided funds to establish and maintain a National Public Internet Site to

provide individuals with disabilities and the general public with technical assistance and information on increased access to AT devices and services, and other disability-related resources (P.L. 108-364).

Americans with Disabilities Amendment Act of 2008 (P.L. 110-325)

The Americans with Disabilities Amendment Act of 2008 amended the Americans with Disabilities Act of 1990 (ADA) and redefined the term “disability” and defined “major life activities" and "being regarded as having such an impairment.” It specified that term should be construed in favor of broad coverage of individuals under the Act. It stated that an impairment substantially limiting one major life activity did not have to limit other major life activities in order to be a disability. The Act affirmed an impairment that is episodic or in remission is a disability if it would substantially limit a major life activity when active. It said that the determination of whether impairment substantially limits a major life activity should be made without regard to the improved effects of specified measures. It prohibited employment discrimination against a qualified individual on the basis of disability. (Current law prohibits employment discrimination against a qualified individual with a disability because of the disability.)

The law declared nothing in the Act: (1) altered the standards for determining eligibility for benefits under state worker’s compensation laws or under state and federal disability benefit programs; (2) altered the requirement to make reasonable modifications in policies or procedures, unless such modifications would fundamentally alter the nature of the goods, services, facilities, or accommodations involved; or (3) provided the basis for a claim by an individual without a disability that the individual was subject to discrimination because of the individual's lack of disability (P.L. 110-325).

Twenty-First Century Communications and Video Accessibility Act of 2010 (P.L. 111-260)

The Communications and Video Accessibility Act of 2010 was divided into two broad Titles. The first Title addressed communications access to make products and services using Broadband fully accessible to people with disabilities. For example, smart phones would be required to be usable by blind and visually-impaired people as well as people with hearing aids.

The second Title of the Act broke new ground to make it easier for people with disabilities to view video programming on television and the Internet. Both titles included provisions to ensure that people with disabilities had access to emergency information such as the next generation of 911 services and emergency information on the television (Federal Communication Commission, 2010).

Types of Assistive Technology

Different types of disabilities require the use of Assistive Technology (AT) devices that encompass a large range of AT services. AT can provide a wide range of assistance for individuals with disabilities such as positioning, mobility, augmentative communication, computer access, adaptive toys and games, adaptive environments, and instructional aids (Bryant & Bryant, 2012). AT is an equalizer for individuals with disabilities, allowing them to live and work in the community of their choice. Therefore, AT has the potential to positively affect a person's environment, leading to increased independence, inclusion, productivity (including employment), and a higher quality of life (Noll, Owens, Smith, & Schwanke, 2006).

Visual Impairments

Individuals who are visually impaired are those who are blind or who have low vision (Cain & Merrill, 2001). Any individual with a visual impairment is entitled to the independence and efficiency afforded by technology. Research has shown that technology can contribute to

improve writing skills, literacy, increase independence, access to information, and better prepare individuals for competitive employment (Holbrook, 1996). The larger challenge now for society is to provide appropriate access to technology for people with visual impairment through individualized assessment of technology needs, appropriate instruction in the use of technology as tools, and equitable distribution of technology.

Individuals who are visually impaired may require devices that provide alternative sensory input. Such devices can be fairly simple or complex; for example, they can include speech, Braille, large-print devices such as CCTV, computer or software programs such as JAWS, Window-Eye, Magic and Zoom-Tex, to name just a few.

To compensate for the visual impairment or distortion, most people use either input through another sense or an enhancement of the visual sense. Today there are various devices on the market that help individuals compensate for the loss of vision or a visual impairment. Some individuals may require low vision devices, such as "bold-lined paper, tactical markers, Braille watches, and white canes" (Levack, Stone, & Bishop, 1994). Low vision devices are tools that individuals who are visually impaired can use to see objects at a distance, read regular print, or do close-up work. These devices can actually be divided into two sections: optical devices and non-optical devices (Levack, Stone, & Bishop, 1994). A person with a visual disability could use hand-held magnifiers. These devices give users the ability to adjust their working distance. They come in a variety of sizes and strengths depending on the person's need. Some magnifiers are stand-mounted and can just be placed directly over the desired page or reading material. This type of device provides a fixed distance between the lens and object. Some have illumination or an additional lens. Other types of low-vision devices are for distance focus such as telescopes and binoculars.

Non-optical devices are AT that electronically enlarges an image. This type of electronic magnifier can be used in conjunction with optical devices in order to provide a full range of adaptation. Examples of non-optical devices can be seen via closed-circuit television, also referred to as CCTV. CCTV can be portable or of the hand-scan type, providing different magnification based on the individual's needs. Sometimes individuals with visual impairment may require computer assistive technology, which necessitates the expertise of an assistive technology specialist and services of a rehab professional who also is knowledgeable about the different devices developed specifically for computer users who are blind or have a visual impairment.

As a foundation for all computer use, keyboarding skills needs to be taught in a systematic and consistent process in order to allow a person with a visual impairment to effectively use a computer. Word processing skills must also be taught in order to allow a person with a visual impairment to become efficient with proofreading, spelling, revising and editing documents. Once knowledge and skill are mastered as the foundation, then the individual with a visual impairment must learn to use telecommunication. According to Crane, Cuthbertson, Ferrell, and Scherb (1997), telecommunication allows an individual to have independent access to a wide variety of information. Through telecommunications, an individual who is visually impaired can read a newspaper and access an encyclopedia independently. This form of communication can provide any person with the opportunity to access reading materials whenever and as long as the person has such a need. Telecommunications can be seen in various formats from CCTV, Braille, and large print to OCR. An OCR system converts graphic images into computer accessible files for individuals using Braille or speech output (Moore, Graves, & Patterson, 1997). Another way that individuals with visual impairment access computers is

through the use of JAWs for Windows, or ZoomText. Through the use of Duxbury and Openbook these particular software packages translate electronic materials into Braille (Kelley, Finley, Koehler, & Picard, 2001). They also convert print materials to an electronic format. Individuals with visual impairment also have the opportunity to access technology via the use of portable note takers which are manufactured by Freedom Scientific. Portable note takers come in different forms which enable the person to complete class assignments, organize their materials, or produce Braille or print copies of their work. ACB Radio is an accessible source for news, entertainment, education programming, policy analysis and dissemination of information of particular interest to people with visually impairments (Kirchner & Drew, 2000).

Hearing Impairments

The most common form of communication between those who are deaf is American Sign Language (ASL). This is a form of AT that allows people with and without a hearing impairment to communicate. It is considered a low form of AT. Individuals who have a hearing impairment utilize a variety of AT devices that provide them with improved accessibility in numerous environments. Most devices either provide amplified sound or alternate ways to access information through vision and/or vibration. These technologies can be grouped into three general categories: hearing technology, alerting devices, and communication supports. Within each main category there may be subcategories based on different purposes or intended audiences when utilizing the technology. The overall goal of all of these devices is improved accessibility to information most people gain through their hearing. Depending on their needs in specific situations, individuals with hearing impairments may require assistive technologies. At times these assistive technologies may be used simultaneously. The term “alerting devices” is used to describe gadgets that can signal your attention and/or indicate the presence of sounds in

the environment through one of three ways: providing a louder sound (for people who are hard of hearing), providing a light flash, or causing a tactile vibration (Dodds, 2003).

There are also Assistive Listening Devices (ALD), which are amplification systems designed to help people hear in a variety of difficult listening situations. They help overcome background noise and distance from a sound source. The basic function of an ALD is to improve the signal-to-noise ratio for the listener. This means that desired sounds (signals) are amplified, and undesirable sounds (noise) are minimized. There are several types of ALD. They are chosen based on the listening situation, listening needs, and personal preferences. These are excellent tools to utilize in a work environment (Dodds, 2003).

Another AT tool for both the workplace and school environment is an FM System. FM Systems use radio frequencies to send sound from a transmitter to a receiver. The speaker, such as a teacher or presenter, wears a microphone which is connected to the transmitter. The person with a hearing impairment wears the receiver which can be connected to a variety of listening devices such as headphones, a neck loop, or sometimes directly to a hearing aid. For hearing aids that are equipped with a T-switch, a neck loop creates an electronic magnetic field between the receiver and the hearing aid, and the FM System can be used without headphones (Luft, Bonello, & Zirzow, 2009).

Most often, the decision for one type over another is based on particular needs related to specific features and may vary over time or for different environments or situations.

All ALD utilize a transmitter to send a person's voice or other sound source to a receiver that distributes the sound evenly throughout a room such as in theaters and churches or directly to an individual. Some hearing aids have a connection option called Direct Audio Input (DAI) that allows the user to connect directly to an FM System or Induction Loop receiver. In many

instances, one can even connect directly to other devices such as a computer, TV, MP3, iPod, or radio. One technology that has made watching television enjoyable for individuals who are deaf and hard of hearing is closed-captioning (CC). Since 1972, CC television programs have been provided. While it was not widely used until the Americans with Disabilities Act made it a requirement, CC allows individuals who are deaf or hard of hearing to read dialogue via text across the bottom of the screen (Dodds, 2003).

Another AT device for individuals who have a hearing impairment is a cell phone equipped with a keyboard or touch screen keyboard. The keyboard provides the individual the opportunity to text, e-mail, or type a message (Vincent, Deaudelin, & Hotton, 2007).

A video camera phone is a form of AT that allows a person with a hearing impairment to communicate through the use American Sign Language (ASL). Similarly, a resource that provides for communication via the Internet is the software program, Skype. This allows the conversation to become more personable, allowing the user to see the facial expressions of the other person. This type of communication can also be used by chat rooms and video conferencing, which are a form of AT (Vincent, Deaudelin, & Hotton, 2007).

Motor Impairments

Individuals with motor impairments face a myriad of challenges with the use of Assistive Technology (AT) because the range of conditions associated with motor impairment is broad (Foley & Regan, 2002). Individuals with mobility impairments often rely on AT to interact with computers and their environment and for mobility. Advancements in motorized wheelchairs, scooters, and manual wheelchairs have vastly increased the functionality of those with mobility impairments. Assistive Technology for computer access provides a wide range of modifications, making it possible for individuals with mobility impairments to attend school or college, secure

gainful employment, and live independently. Even persons with significant mobility impairments can use computers equipped to follow and interpret commands based on eye movement, head movement or breath. Modern Screen Readers can scan books and convert the text for individuals who are unable to carry books. For individuals who have difficulty operating a mouse, all computers include mouse keys, slow keys, and sticky keys, which adapt the computer to the user's needs and capabilities. The Microsoft Corporation offers assistive-technology hardware and software products (such as screen readers and voice recognition products) that provide essential accessibility to computers for those with mobility impairments (Dove, 2012).

Environmental control units (ECU) provide access to an individual's environment, allowing the individual with a mobility impairment increased control over the environment, including controlling the TV, phone, bed, thermostat, and other appliances, furniture and devices. Voice, touchpads, switches, joysticks, head movement, and eye tracking can operate environmental control units. Assistive Technology aids for daily living include specially-designed bathtubs, shower stalls, and toilet seats, as well as adapted grooming aids, cooking devices, eating utensils, handrails, and mobility ramps (Dove, 2012).

Cognitive Impairments

Individuals with cognitive impairments encounter a wide variety of memory, perception, problem solving, and conceptualizing challenges resulting from conditions such as autism, traumatic brain injuries, and intellectual disabilities. Individuals with cognitive impairments require AT devices that assist with attention, memory, perception and processing, and problem solving (Crow, 2008).

Assistive Technology devices for individuals with cognitive impairments can be used to augment and assist cognitive processes such as attention, memory, self-regulation, navigation, emotion recognition and management, planning, and sequencing activity. General User Interface for Disorders of Execution (GUIDE) is an interactive, verbal-prompting system that talks to individuals with cognitive impairments through routine tasks. AT devices such as visual schedules, calendars, organizers, and voice emotional-recognition software can be used by individuals with cognitive impairments in the areas of education, employment, and independent living, improving functional capabilities and decreasing the occurrence of challenging behaviors (Dove, 2012).

Communication Impairments

Augmentative communication devices, also known as augmentative or alternative communication (AAC), refer to the various forms of communication devices that are used as a supplement to oral language, including voice-output communication devices and computers with synthetic speech. Individuals with communication impairments can now communicate by using synthetic speech, an artificial human speech form, produced by an electronic synthesizer that is activated by a keyboard (Dove, 2012).

Information in Table 1 provides a list of disabilities, functional limitations of each disability, and the assistive technology tools needed to overcome the functional limitation. The functional limitations were compiled from *The Disability Handbook* (Andrew, 2008).

Table 1

Disability + Functional Limitation + Assistive Technology Tools

Disability	Functional Limitations	Assistive Technology Tools
Visual Impairments	Reading, writing, navigation, mobility, driving, transportation, space perception, form perception, depth perception, color discrimination, field of vision, deficit, night vision deficit	High contrast pen, portable word processor, screen reader, Braille typing, voice recognition software, tactile graphics, handheld recorder, computer, cane, monocular, Braille/talking compass, electronic travel device, talking GPS device, tablet magnification program, screen reader with magnification, large print, optical magnifier, electronic magnifier, CCTV
Hearing Impairments	Discriminating sounds Understanding instructions Communicating with peers Speech clarity Intelligibility/context meaning of sounds Balance/motor coordination	Sign language, text devices, real time captioning, video interpreting, Hearing technology: FM systems, infrared systems, induction loop, 1:1 communicators, hearing aids, cochlear

		implants, tablet, computer w/webcam, handwriting, cell phone, pager, TTY, amplifier, captioned phone, closed captioning, person to person, pen/paper, portable texting device, print copies, electronic note-taking,
Motor Impairments	Ambulation, strength, propelling wheelchair, coordination, stamina, self-care, range of motion in extremities, muscle control, reflex control grasping, handling, hand/finger dexterity, wheelchair independence, transfer, writing, driving, transportation	Crutches, walker, cane, grab bars, reacher, independent living aids, ramp, manual wheelchair, powered wheelchair w/joystick or other control devices, powered scooter workstation at correct height and depth tablet, modified desk, adapted/alternate chair, computer, alternative mouse, alternative keyboard, eye gaze, brain waves, word prediction software, voice recognition software,

		switches, read and write software, stander, Hoyer lift, transfer board. barrier-free lift, adapted vehicle, public transportation, environmental control unit
Cognitive Impairments	Time management, conceptualization, decision making skills, memory, organizational skills, planning ability, concrete thinking, self-direction, attention span, maturity, concentration, attention to task, abstract thinking, following instructions, Interpersonal skills, communication, reading, writing, math, spelling, mobility, self-care, inflexibility, irritability, social judgment, social awkwardness, feelings of isolation, impulsiveness,	Sticky notes, index cards, highlighters, handheld recorders, word prediction software, read and write software, literacy software, reminder charts, study guide, smart pen, digital highlighter, handheld scanners, personal digital assistance (PDA's), tablets, applications, computers, voice recognition software, online web tracker, digital graphic organizer, calculator, travel device, talking GPS device, hand controls, money counter, calendar, social stories, voice

	aggressiveness, work tolerance, behavioral problems, problems handling money, inability to carry out previously learned tasks, driving, transportation	organizer software, voice reminder software, public transportation.
Communication Impairments	Communication, weakness or incoordination of speech mechanism, speech clarity.	Augmentative or alternative communication device, picture exchange or index cards, communication board or book, computer, tablet, sign language.

Barriers to Using Assistive Technology

Individuals with disabilities are often introduced to AT by a rehabilitation counselor or educator providing an essential link between the consumer and the assessment and acquisition of AT (Scherer, Sax, Vanbiervleit, Cushman & Scherer, 2005). The implementation of AT also often requires the involvement and services of a number of professionals in a multidisciplinary team (Chmiliar & Cheung, 2007). Therefore, training rehabilitation professionals in AT is essential for individuals with disabilities to properly utilize AT. Training rehabilitation counselors in AT is important for potential consumers as well as being required by law and accreditation standards. The Rehabilitation Act Amendments of 1992 significantly increased access to AT for individuals receiving rehabilitation services.

Specifically, the Individualized Plan for Employment (IPE) must include a determination of need for specific AT services to assist in the implementation of intermediate rehabilitation objectives and long-term goals (Justesen & Menolve, 1994). The Amendments also stressed the effects AT has on employment and independent living (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007).

According to standards established by CORE (2008) for working with individuals with disabilities, rehabilitation counselors should be able to: apply the techniques of job modification/ restructuring and the use of AT devices to facilitate consumer placement when appropriate (C.4.8); determine the need for AT and the appropriate intervention resources (C.9.4); identify and plan for the appropriate use of AT including computer-related resources (C.10.13) (CORE, 2008). Although CORE has recognized the importance of educating rehabilitation counseling students regarding AT, it has given each accredited institution the freedom to decide how AT is taught within the rehabilitation counselor education curriculum (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007).

Legislation and accreditation standards stress the importance of training rehabilitation counselors in AT. However, the research indicates a lack of training in school settings for rehabilitation professionals. A survey was conducted to assess the attitude of program coordinators from 47 vocational rehabilitation training programs who were CORE Accredited on AT training. Of those program coordinators, 36 percent indicated that there was at least one specific course on AT offered and 53 percent of the programs required an AT course for master's students in rehabilitation counseling. Over 80 percent of the respondents felt AT knowledge was important, but only 67% percent reported the infusion of AT knowledge in the general curriculum (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007).

Noll, Owens, Smith, and Schwanke (2006) conducted a survey to measure the opinions of 140 state agency vocational rehabilitation counselors regarding AT in Wisconsin. Only a limited number of counselors reported receiving AT training in their degree or certificate programs and only 37 percent of the responding counselors indicated having AT as part of their degree program. Conference and professional in-service were the most common forms of AT training received, while overall counselors indicated a near total lack of confidence in performing direct AT activities (Noll, Owens, Smith, & Schwanke, 2006).

Riemer-Reiss (2003) sent a self-report survey to practicing rehabilitation employees (including counselors and supervisors) who provided direct services to consumers. From the employees who responded, 80 percent reported gaining AT education while attending workshops rather than from their academic programs or employment settings. Reimer-Reiss also found that counselors who received AT education in school were more likely to select AT devices and services and to refer their customers appropriately to AT specialists (Riemer-Reiss, 2003).

The research indicates a lack of training in school, but a relatively high percentage of AT training occurs outside the school environment. It is imperative to teach rehabilitation counselors, while they are in school, to successfully implement AT with consumers. Academically training rehabilitation counselors on AT can be difficult because no formal structure is available to inform the core curriculum on AT subject matter. Researchers feel it may be necessary for CORE to consider the importance and efficacy of AT in developing the requirements of graduate rehabilitation counseling training programs. With a lack of AT curriculum guidance, some professionals have developed online AT courses to train future practitioners (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007).

Chmiliar and Cheung (2007) described an online AT course implemented at Athabasca University specifically for teachers. The course had many components including an AT Tool Lending Library, discussion forums, multimedia clips, and interactive study modules. The course was relatively new, but it had positive feedback and individuals in the field were taking leadership roles in AT because of the training (Chmiliar & Cheung, 2007).

Increasing accessibility of AT training for rehabilitation professionals is essential to ensure they carry out their job responsibilities. Leahy, Chan, and Saunders (2003) explored the major knowledge domains and job functions of Certified Rehabilitation Counselors (CRCs) and indicated that CRCs should be knowledgeable about AT in the career assessment process and be prepared to provide reasonable accommodation consultation to employers. Additionally, AT was reported as an area of critical need for CRCs at the pre- and in-service levels (Leahy, Chan, & Saunders, 2003).

Research found that AT knowledge is highly desirable for effective rehabilitation counseling practice. It was reported that rehabilitation professionals have identified AT as an area in which more training is needed, and the provision of AT education will likely lead to more effective rehabilitation counseling services and outcomes (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007).

The literature shows a strong link between training rehabilitation counselors in AT and successfully implementing AT with future consumers. AT can allow individuals with disabilities to live and work independently which can also decrease their reliance on governmental assistance. However, the benefits cannot be realized if practitioners are not trained in AT advancements. Developing accessible AT training is imperative for rehabilitation counselors to accurately meet legislative and accreditation standards as well as successfully meeting

consumers' needs. Outcomes of AT use are important indicators of the quality service delivery process. From the perspective of consumers and rehabilitation providers, equally or more important is being able to create an optimal match of person and technology at the outset and involve the consumer in AT selection. Recent developments in outcomes assessment research confirm the importance of an appropriate early assessment of consumer needs for AT (Scherer, Sax, Vanbiervleit, Cushman, & Scherer, 2005).

As the available options and features of assistive technologies have increased, their use has been more widely considered and recommended. Differences among individual users can be better accommodated due to this expanded choice; however, the process of matching person and technology remains complex because people's expectations of and reactions to technologies are complex. Reactions are also highly individualized as people react to changes in their physical and sensory capabilities according to many factors. These factors include their personality and personal attitudes; background experiences; lifestyle preferences; established interpersonal networks and communication needs; judgment and outlook regarding their perceived capabilities and functioning in a variety of situations; subjective quality of life/well-being; and the adjustment patterns they have established to deal with loss and change. Expectations and reactions also emerge from varying needs, abilities, preferences, and past experiences with and exposures to technologies and social/cultural/environmental support for technology use (Scherer, Sax, Vanbiervleit, Cushman, & Scherer, 2005).

One model that has been posited to account for these myriad influences is the Matching Person and Technology (MPT) Model and accompanying assessment instruments, first presented in 1989. The MPT Model focuses on three primary areas: (a) milieu/environment factors influencing use; (b) consumer personal and psychosocial characteristics, needs and preferences;

and (c) functions and features of the most desirable and appropriate technology. Components of the three primary areas in the MPT Model have been depicted and described in detail elsewhere. To place the model and theory into operation, an assessment process consisting of several instruments was developed through participatory action research addressing differences between technology users and non-user (Scherer, Sax, Vanbiervleit, Cushman, & Scherer, 2005).

The relationships between AT and individuals with disabilities in the areas of education, employment, and independent living is imperative for individuals with disabilities to approach an even playing field with individuals without disabilities. The challenge to society is recognizing that AT is of primary significance in affording Americans with disabilities the highest degree of independence possible, in attaining higher education degrees, successful careers, and fruitful lives. This includes individuals with significant disabilities, despite the fact that this might mean more intensive services and workplace supports. AT is a foundational support that produces multiple and life-changing benefits. While we know much about the impact of AT on the lives of individuals with disabilities, many unanswered issues and questions remain (Stumbo, Martin, & Hedrick, 2009).

While AT can be an important part of the rehabilitation plan for workers with disabilities, AT may not be effective if it is applied inappropriately, if workers choose not to use it, and/or the selection of a specific product is not made in a systematic way. The user's perception of the relative advantage of technology, compatibility of the AT, and consumer involvement in the selection of the technology, were predictors of adoption or discontinuance of an accommodation (Gamble, Dowler, & Orslene, 2006).

Vocational rehabilitation professionals are the primary source of vocational services for people with disabilities. As such, one responsibility of rehabilitation professionals is to facilitate

the access and use of AT for the consumers they serve. Having the necessary knowledge of AT and skills in working through a systematic selection process are critical to successful consumer employment outcomes. Research on continuing education and technology awareness in the educational process is needed. The benefit of expanded training for rehabilitation professionals is likely to lead to increased opportunities and employment for consumers. A variety of barriers to successful implementation of AT have been described in the literature. Also, the value of including the consumer in all phases of the AT selection process has been demonstrated. Use of a systematic decision-making process, although time intensive, may reduce traditional barriers to AT, increase the perceived effectiveness of accommodations, and reduce costs associated with discontinuance (Gamble, Dowler, & Orslene, 2006).

Despite many breakthroughs in technology, there are still a number of barriers that prevent effective implementation within K-12 classrooms. Barriers include inadequate assessment, high costs of equipment and maintenance, lack of resources and materials, and the lack of time teachers have to learn about new products and plan for effective usage in the classroom (Copley & Ziviani, 2004). Perhaps the most surprising barrier is the lack of knowledge in both school districts and pre-service special education programs (Ashton, 2005).

A survey comprised of 154 special education personnel in California was designed to assess perceived knowledge, attitudes, and challenges of AT use by special education teachers. The results indicated that 41% of teachers indicated the number one barrier to AT use was the lack of knowledge and training. Nineteen percent reported a lack of resources and materials available for use in the classroom. The third barrier reported by 18.5% of the teachers was the time required to learn about new products and to plan for effective usage in the classroom.

Finally, the study revealed that 16% reported funding as a barrier, which is also related to the lack of resources and materials (Ashton, 2005).

Lack of Funding

AT greatly benefits persons with disabilities. It has the potential to accommodate for a person's disability in a way that lessens or ameliorates any functional limitations. It can be used in school, at home, at work, in the community, and for recreation. When provided in any of these situations, AT can change the life of a person with a disability. Even though AT holds much promise, it is under-utilized. Many factors contribute to under-utilization of AT, but one prevailing issue is that of funding (Inge, 2006). In fact, lack of available funding is often cited as the greatest barrier facing people with disabilities and their family members as they work to acquire the AT devices or services that they need (Brooke, McDonough, & Hardy, 2006)

Impact of Using Assistive Technology

One of the chief benefits of AT use that is highly relevant for children with multiple disabilities is as a means of enabling mastery or control over their environment, including enhanced exploratory play and independence in activities of daily living Two comprehensive studies of AT applications in schools found that facilitating independence (including developing autonomy and self-determination) was among the most frequently cited benefits identified by parents and teachers (Copley, & Ziviani, 2004).

A commonly reported benefit to self-determination is the ability to make choices and direct one's care with the use of augmented or alternative communication. Other outcomes include enhanced social interactions, increased motivation, and self-esteem. A further area that has been demonstrated to improve with the use of AT is skill acquisition and enhancement, such as handwriting, motor skills, reading, visual attention and perception, and math skills. Cognitive

benefits associated with AT use include understanding of the cause–effect relationship, increased attention span, and problem-solving ability. Teachers have further recounted improvements in general academic behavior such as work habits and productivity (Copley & Ziviani, 2004).

Observing the overall benefits associated with the use of AT by children with multiple disabilities, parents and teachers have recognized the capacity of AT to offer children new opportunities, reveal their potential, and provide them with the tools to realize that potential (Copley & Ziviani, 2004)

Assistive Technology is crucial to removing barriers for individuals with disabilities in the areas of employment and independent living. AT is an equalizer for individuals with disabilities. Today there are 33 million working-age Americans with disabilities and 14.5 million of them are unemployed. Of those who are unemployed, two out of three would prefer to be working. Yet the unemployment rate for working-age adults with disabilities has remained abysmally high for more than a decade. One solution is AT. AT is an essential tool for helping individuals with disabilities participate more fully in productive work and community living. Little systematic effort has been devoted to examining AT use and outcomes as they relate to employment and independent living for individuals with disabilities (Mendelsohn, Edyburn, Rust, Schwanke, & Smith, 2008).

For individuals with disabilities, AT devices play a vital role in obtaining employment and improving daily work performance and living independently. AT can assist in bridging the gap between a person's physical abilities and the job requirements. Many workplace challenges can be overcome or eliminated by using AT in combination with other types of workplace supports. Despite the promise of AT, it is underutilized to facilitate employment, therefore many individuals with significant disabilities remain unemployed

In order for students with disabilities to receive high-quality education, AT must be available to enhance educational success and more concrete research on the effectiveness of assistive technology needs to be conducted (Kelly, & Smith, 2011).

There are several factors that contribute to the still-lagging use of AT, including lack of information on available technology; lack of coordination across services; lack of training on how to use AT; lack of coordination in the evaluation and selection of AT; and lack of funding for AT. Research is needed to determine the utilization of AT in employment and to determine how vocational rehabilitation programs can utilize AT for individuals with significant disabilities to obtain or retain gainful employment in the primary labor market so as to live the American dream.

CHAPTER III. METHODS AND PROCEDURES

Chapter One introduced the topic of this research study. The chapter also provided the statement of the problem, need for the study, and the questions that guided the research. It provided the statement of the hypotheses to be tested and concluded with a definition of the terms used in this study, the assumptions and limitations of the study, and the significance of the study.

Chapter Two presented a review of the literature on the utilization of assistive technology/rehabilitation technology (AT/RT) services and equipment by VR counselors serving individuals with significant disabilities. The definition of significant disabilities was stated along with a historical review of AT/RT. Information in the chapter provided key legislation that has impacted AT/RT and how AT/RT services and equipment are defined. Chapter Two reviewed the Rehabilitation Act of 1973 and its subsequent amendments that mandated rehabilitation technology for individuals with the significant disabilities. The chapter discussed and defined various types of AT/RT equipment and associated the AT/RT equipment with the functional limitations of each disability, as well as the AT/RT equipment that could be used to accommodate the functional limitation. The chapter concluded with a discussion of the barriers to utilizing AT/RT services and equipment and the impact they could have on individuals with the most significant disabilities.

Information in this chapter presents the methods and procedures used to conduct this research study. Information on the participants, setting for the study, design of the study, and data analyses are included. The focus of this study was to identify the lack of information related to VR counselors' confidence in their ability to identify and provide services and equipment, perceptions of AT/RT and perceptions of their AT/RT training needs. The researcher explored

the related research and literature on VR counselors' confidence related to AT/RT services, perception of AT/RT, and perception of their role in the utilization of AT/RT. In order to measure the counselors' confidence of AT/RT the Rehabilitation Technology Counselor Survey (RTCS) survey was used. In addition, a researcher-developed demographic and professional profile questionnaire was used to collect data, such as participant gender, age and education level.

Procedures

The procedures used for this study were as follows.

1. The researcher developed a demographic questionnaire.
2. The researcher modified the instrument.
3. With assistance from the research methodologist, the researcher entered the demographic questionnaire and RTCS survey into the Qualtrics software, enabling participants to respond anonymously (Qualtrics, 2013).
4. An internet-based demographic and professional profile questionnaire and survey was hosted on the web server at Auburn University to alleviate concerns counselors might have had regarding confidentiality and their employer having direct access to their responses.
5. The researcher submitted a research protocol review form to the University Institutional Review Board (IRB) for conducting research involving human subjects.
6. Following approval of the IRB protocol, the researcher contacted the assistant commissioner of vocational rehabilitation (VR) programs working for one state VR program in the southeast region of the United States via telephone to request assistance to disseminate the Participant Recruitment Request (Appendix 3), the Electronic Information Letter of Informed Consent (Appendix 4) and the Follow-up Letter (Appendix 5).

7. After the commissioner of VR programs agreed to disseminate the documents, the researcher sent the Participant Recruitment Request in the body of an email and the Electronic Information Letter of Informed Consent as an attachment to the email to the commissioner. The Participant Recruitment Request (Appendix 3) provided an introduction, explained the purpose of the research study, requested counselor participation, and informed counselors their responses would be confidential and anonymous. The VR counselors who chose to participate in the study were instructed to open the research instrument via the link on the attached Electronic Information Letter of Informed Consent (Appendix 4).

8. Upon receipt, the commissioner forwarded the Participant Recruitment Request in the body of an email and the Electronic Information Letter of Informed Consent as an attachment to the email to the total population of 185 VR counselors within the state VR program.

9. The participants had a total of four weeks to complete the demographic and professional profile questionnaire and the RTCS.

10. The researcher contacted the commissioner via telephone as a reminder that the first two-week period came to an end and to send the first Follow-up Letter (Appendix 5) and the Electronic Information Letter of Informed Consent (Appendix 4) via email to participants.

11. The commissioner forwarded the Participant Follow-up Letter (Appendix 5) in the body of an email and the Electronic Information Letter of Informed Consent as an attachment to encourage participants to complete the demographic and professional profile questionnaire and the RTCS if they had not done so. At the end of the follow-up period, the survey was closed.

12. At the end of the four-week period, the researcher imported the data into an IBM-SPSS (Version 22) spreadsheet for analysis.

Participants

The participants for this study were from the total population of vocational rehabilitation (VR) counselors working for one state VR agency located in the southeast region of the United States. The total population for this study was 185 VR counselors who are providing VR services to individuals with disabilities at the time of the study.

Setting

The study used an internet-based demographic and professional profile questionnaire and survey hosted on the web server at Auburn University. Vocational Rehabilitation (VR) counselors employed by one large state VR program located in the southeast region of the United States participated. The VR program was established in 1973, and in 2013 the program served 31,382 consumers, the majority of whom (78%) were individuals coded in case files as having significant disabilities. The state VR program employed 185 VR counselors (ADRS, 2013) at the time of this study.

Instrumentation

For the study, demographic queries such as age, gender, ethnicity, level of education, CRC eligibility, years as a VR counselor, population of disability served, and specific training or courses in AT/RT were included in the first section of the survey. In order to measure the counselors' perceptions of AT/RT and their role in the AT/RT process, a list of potential AT/RT roles and perceptions were generated for this survey with input from VR counselors. The questions covered several areas: number of AT/RT service providers, the counselor purchased services, the number of consumers that counselors referred for AT/RT services, and the extent to which the rehabilitation counselors felt making referrals or purchasing AT/RT was part of their role.

The survey instrument for this study was based on the Rehabilitation Technology Counselor Survey (RTCS), developed by Dr. Roger Smith and a team of researchers he led on a project called, Assistive Technology Outcomes Measurement System (ATOMS). The ATOMS Project was a five-year assistive technology outcomes and impact project funded in part by the National Institute on Disability and Rehabilitation Research (NIDRR) under the Disability and Rehabilitation Research Projects (DRRP) program. One component of the ATOMS project was to conduct research on state VR programs. VR counselors working for state VR programs provided content review and edits to assist in the development of the RTCS. The survey development team consulted with the University of Wisconsin-Milwaukee Institute for Survey and Policy Research (ISPR) for input and suggestions from their expert survey developers to assure the instrument was valid and reliable.

Questions for this survey instrument were designed to have respondents answer a series of questions to identify their perceived role and perceptions of their confidence in providing AT/RT services and equipment. Additional questions asked about the number of AT/RT service providers; counselor purchased services, and the number of consumers counselors referred for AT/RT services. With the advancements in AT/RT and the impact it can have on individuals with significant disabilities every state vocational rehabilitation program needs to access their VR counselors' knowledge and utilization of AT/RT to determine if individuals with significant disabilities have access to the AT/RT they need to gain productive employment. The demographic and professional profile questionnaire and the original RTCS survey was modified by the researcher, with permission from Smith, to be administered online with the cooperation of one state VR program in the southeast region of the United States. Distribution was facilitated

by e-mailing a link to the demographic questionnaire along with the RTCS survey (see Appendix 1 and 2). Qualtrics was used as the software platform.

Demographic and Professional Profile Questionnaire

The participants were given an opportunity to complete a questionnaire that was adopted and modified with permission from Dr. Roger Smith. The survey tool was used by Smith (1996) to conduct research on VR counselors in Wisconsin. A panel of experts established face and content validity of the instrument used in this study. The panel of experts included three vocational rehabilitation counselors, one AT/RT specialist, and a research methodologist. The researcher and methodologist modified the instrument to collect demographic and professional information (see Appendix 1). The demographic and professional profile questionnaire collected the following information: (1) age, (2) gender, (3) ethnicity, (4) level of education, (5) CRC eligibility (6) years as a VR counselor, (7) population of disability served, and (8) specific trainings or courses in assistive technology/rehabilitation technology. The questionnaire was designed to be completed in approximately five minutes. The researcher consulted with the methodologist on his committee to make the questionnaire available online through the Qualtrics survey software.

The Rehabilitation Technology Counselor Survey (RTCS)

The participants were given an opportunity to complete the Rehabilitation Technology Counselor Survey (RTCS) online to indicate their role in AT/RT. The RTCS was used to identify the confidence level that VR counselors have regarding AT/RT, and thus assist in identifying the education and training VR counselors need to become knowledgeable of AT/RT.

The RTCS consists of 51 items divided into five sections: (1) demographic information, questions 1 through 8, (2) role in AT/RT and confidence level in providing AT/RT services and

AT/RT equipment, (3) perception of AT/RT services and equipment, (4) AT/RT purchased and provided, and (5) AT/RT training needs. Questions 9 through 34 address the VR counselor role in AT/RT and their confidence level in providing AT/RT services and equipment. These questions asked the VR counselor to respond to a series of questions with a yes or no response pertaining to their role as a VR counselor in performing AT/RT services. It also asked VR counselors to indicate their level of confidence for each item, such as making referrals for AT/RT services and managing the provision of AT/RT services. It also addressed purchasing AT/RT equipment, providing consumers with information on AT/RT equipment, installing AT/RT equipment, modifying/fabricating AT/RT equipment, training consumers on how to use the AT/RT equipment and assisting consumers in the selection of the AT/RT equipment.

Questions 35 through 41 address the VR counselors' perception of AT/RT services and equipment. Responses to these items were recorded on a five- point Likert-type scale for a series of questions pertaining to the cost of AT/RT, the reliability of AT/RT, procedures involved in providing AT/RT services and equipment, the availability of AT/RT services in their service area, and the effectiveness of AT/RT services. It also asked the VR counselor to identify the consumers' needs for AT/RT services and AT/RT equipment to meet their employment goal, the effectiveness of the AT/RT solutions provided to their consumers, and the overall outcome of the AT/RT equipment provided to their consumers. Questions 42 through 45 asked the VR counselor to provide information on the number of consumers they referred for AT/RT and the number of consumers they provided AT/RT services in the last 12 months. Questions 46 through 51 asked the VR counselor to check the AT/RT services and equipment they provided to consumers in the last 12 months. These items provide a commonly used list of AT/RT services and equipment.

These items asked the VR counselors to respond to all categories that apply as they relate to AT/RT services and AT/RT equipment.

Design of the Study

The researcher used a survey research design to identify counselor confidence in their ability to identify and provide AT/RT services and equipment, counselor perceptions of AT/RT, and their perceptions of their AT/RT training needs. The survey instrument was designed to collect information in each of the following categories. (1) demographics, (2) role in AT/RT and confidence level in providing AT/RT services and AT/RT equipment, (3) perception of AT/RT services and equipment, (4) AT/RT purchased and provided, and (5) AT/RT training needs.

Data Analysis

Frequency and percent of responses were calculated for the first research question to identify the demographic characteristics of participants. Specifically, participant age group, gender, ethnicity, level of education, CRC eligibility, number of years as a VR counselor, populations served, and AT/RT training were considered. Likewise frequency and percent of responses were calculated for research questions two, three, and four. Null hypotheses one and two were tested using a one-way analysis of variance statistical procedure (ANOVA) at the .05 level of significance to respond to research questions five and six. Research questions addressed the VR counselors' confidence in their ability to identify and provide AT/RT services and equipment and perceptions of their role in identifying and providing AT/RT services and equipment. In addition, responses to research questions five and six were calculated based on frequency and percent of AT/RT services purchased and provided by a counselor and the types of AT/RT services and equipment purchased by counselors over the last 12 months.

CHAPTER IV. RESULTS

Chapter Three discussed the methodology for the study, presented six research questions and two null hypotheses. The chapter presented information on the participants, setting, and instrumentation. In addition, the chapter discussed the design of the study. This chapter discusses the results of the analysis.

The current study investigated the role of the vocational rehabilitation (VR) counselor in providing Assistive Technology/Rehabilitation Technology (AT/RT) for their clients to achieve their employment goal. To determine this role counselors working for one state VR agency located in the southeast region of the United States completed the Rehabilitation Technology Counselor Survey (see Appendix 2) online to indicate their role in AT/RT. Counselors' demographic and professional profile was assessed by a demographic and professional profile questionnaire developed by the researcher (see Appendix 1). The following research questions guided this study.

1. What are the demographic characteristics of the participants in this study, based on age group, gender, ethnicity, level of education, CRC eligibility, number of years as a VR counselor, populations served?
2. What kinds of AT/RT training have VR counselors completed?
3. How often are AT/RT services purchased and provided by a VR counselor?
4. What types of AT/RT equipment were purchased by VR counselors over the last 12 months?
5. To what extent are VR counselors confident in their ability to identify and provide AT/RT services and equipment based on their perception of their role in identifying and providing AT/RT services and equipment and the populations they serve?

6. To what extent is there a difference in VR counselor perceptions of AT/RT services based on gender?

The following hypotheses were tested at the .05 level.

Ho: 1 There is no statistically significant difference in counselor confidence in identifying and providing AT/RT services for counselors who perceive AT/RT as part of their role and those who do not.

Ho: 2 There is no statistically significant difference in vocational rehabilitation counselors' perception of confidence in identifying and providing AT/RT services based on gender.

The results for this study were as follows:

The first research question focused on the demographic characteristics of the participants in this study, based on age group, gender, ethnicity, level of education, CRC eligibility, number of years as a VR counselor, and populations served. The survey yielded 43 returns; however, three surveys were incomplete and could not be used for this study. With 40 out of 185 usable surveys completed, the response rate was 22%.

The age groups ranged from 23 to older than 55. Four participants (10%) indicated that they were 23 to 27. Five participants (13%) reported they were 28 to 34. Eight participants (20%) reported they were 35 to 44. Nine participants (22%) reported they were 45 to 54. Fourteen participants (35%) reported they were 55 and older. There were eight males and 32 females who participated in the study. There were 30 white/caucasian participants and 10 African American participants.

The levels of education were as follows. Twenty-seven participants (68%) had a Masters in Vocational Rehabilitation. One participant had a Master of Education. Twelve participants (30%) had a Masters in Counseling. All 40 of the participants were eligible to take the CRC.

The number of years as a VR counselor ranged from one to more than twenty-one. Nine participants (23%) reported they were VR counselors for one to five years. Ten participants (25%) reported they were VR counselors for six to ten years. Six participants (15%) reported they were VR counselors for eleven to fifteen years. Nine participants (23%) reported they were VR counselors for sixteen to twenty years. Six participants (14%) reported they were VR counselors for over twenty-one years. Table 2 displays the demographic results.

Table 2

Results for the Demographic Variables

Variable	Frequency of Response	Percent
Age		
23 to 27	4	10
28 to 34	5	13
35 to 44	8	20
45 to 54	9	14
55 and older	14	35
Gender		
Male	8	20
Female	32	80
Ethnicity		
White/caucasian	30	75
African American	10	25

(table continues)

Variable	Frequency of Response	Percent
Degree Earned		
Master – VR	27	68
Master – Education	1	2
Master – Counseling	12	30
Years as a VR Counselor		
1 – 5	9	23
6 – 10	10	25
11 – 15	6	15
16 – 20	9	23
21 or more	6	14

Thirty-one counselors (77%) reported they served individuals with physical disabilities. Eight counselors (20 %) reported they served individuals with low vision or blindness. Five counselors (11 %) reported they served individuals who identify as hard of hearing. Thirty-three counselors (62 %) reported they served individuals with cognitive disabilities. Twenty-four counselors (60%) reported they served individuals with other disabilities and listed them as those who are transitioning from high school, have Autism Spectrum Disorder, or have mental health/mental illness disabilities. These data are displayed in Table 3.

Table 3

Results of Populations of Disabilities Served

Disability Served	Frequency of Response	Percent
Physical	31	72
Blind & Low Vision	7	16
Deaf & Hard of Hearing	5	12
Cognitive	32	74
Other	24	56

The second research question focused on the kinds of AT/RT training VR counselors completed. Eighteen VR counselors reported they received 1 to 10 hours of AT/RT training from professional in-service. Three VR counselors reported they received 11 to 20 hours of AT/RT training from professional in-services. One VR counselor reported (s)he received 21 to 30 hours of AT/RT training from professional in-services. Three VR counselors reported they received thirty or more hours of AT/RT training from professional in-service.

Six VR counselors reported they received 1 to 10 hours of AT/RT training from AT/RT conferences. Eight VR counselors reported they received 11 to 20 hours of AT/RT training from AT/RT conferences. Three VR counselors reported they received 21 to 30 hours of AT/RT training from AT/RT conferences. One VR counselor reported (s)he received thirty or more hours of AT/RT training from AT/RT conferences. Results for AT/RT training are reported in Table 4.

Table 4

Results of Reported AT/RT Training

AT/RT Training	1-10 hours	11-20 hours	21-30 hours	30+ hours
Certificate	3	0	0	0
Credit w/degree	13	2	0	2
Continuing Ed	12	5	2	3
Prof In-service	18	3	1	3
AT/RT Conf.	6	8	3	1

The third research question focused on how often AT/RT services were purchased and provided by a VR counselor within a 12-month period. Fifty-two percent of the counselors reported they purchased and provided AT/RT services one to three times in a 12-month period. The percent of counselors who reported the frequency of AT/RT services are reported in Table 5.

Table 5

Results of AT/RT services purchased within a 12-month period

AT/RT Services Purchased	Frequency	Percent
0	3	8
1-3	21	52
4-6	11	27
7-10	3	8
10+	2	5

The forth research question focused on the types of AT/RT services and equipment that were purchased by VR counselors over the last 12 months. Forty-six percent of the counselors reported purchasing computer access and mobility/seating combined. These data are reported in Table 6.

Table 6

Results of AT/RT Equipment Purchased Over the Last 12 Months

Type of Equipment & Service	Number of Counselors Reporting
Augmentative & Alternative Communication	8
Computer Access	25
Workplace Modifications	18
Sensory-Related AT/RT	10
Mobility/Seating	21
Transportation	20

The fifth research question focused on the extent to which VR counselors are confident in their ability to identify and provide AT/RT services and equipment based on their perception of their role in identifying and providing AT/RT services. This research question was addressed with the first null hypothesis.

> Ho: 1 There is no statistically significant difference in counselor confidence in identifying and providing AT/RT services and equipment for counselors who perceive AT/RT as part of their role and those who do not.

Results for the first null hypothesis show a statistically significant difference in counselor confidence in identifying and providing AT/RT services and equipment for counselors who perceive AT/RT as part of their role and those who do not, $F(1, 38) = 26.64$, $p = .000$. The first

null hypothesis was rejected. The mean score for those perceiving AT/RT activities as part of their role (N = 26) was 27.0, with a standard deviation of 3.97; the mean score for those perceiving AT/RT activities not related to their role as a vocational rehabilitation counselor (N = 14) was 20.71, with a standard deviation of 3.02. A score of 27 on total confidence may be interpreted as a positive outcome, since the mid-point of the range for a total confidence score was 13 meaning no confidence and 39 meaning total confidence. A score of 26 was necessary for somewhat confident. Levene's test for equal variances showed no statistically significant difference in the variances on the dependent variable for those counselors who viewed AT/RT activities as part of their role and those who did not, $F(1, 38) = 1.58$, $p = .22$.

The sixth research question focused on the extent to which there is a difference in VR counselor perceptions of their confidence in identifying and providing AT/RT services and equipment based on gender. This research question was addressed with the second null hypothesis.

> Ho: 2 There is no statistically significant difference in vocational rehabilitation counselors' perception of confidence in identifying and providing AT/RT services based on gender.

Results for the second hypothesis showed no statistically significant difference between male and female vocational rehabilitation counselors in their confidence in identifying and providing AT/RT services, $F (1, 38) = .079$, $p = .780$. Therefore, the second null hypothesis was retained. The mean score for males was 24.38, with a standard deviation of 2.72; the mean score for females was 24.91, with a standard deviation of 5.14 The Levene's test revealed equal variances on the total confidence scale for males and females, $F (1, 38) = 2.69$, $p = .11$.

Cronbach alpha for internal reliability for the 13 items on the AT/RT Role Scale was 0.76 (.77 based on the standardized items); 0 .76 is a fairly high alpha level for internal consistency.

Summary

This chapter presented the results of the statistical analysis and other data identified through this study. Calculations for demographic information revealed that most counselors participating in this study were 45 years of age and older (49%), most were female (80%), and most were white/Caucasian (75%). All the participants had earned a Master's degree, and 37% had 16 or more years as a counselor. The most frequently served populations were individuals with physical (72%) and cognitive (74%) disabilities.

Most counselors received one to ten hours of AT/RT training, which included training such as continuing education, AT/RT conferences, and professional in-service training. Fifty-two percent of the counselors purchased AT/RT services one to three times within a 12-month period, and only five percent purchased 10 or more services within that time frame. Computer access and mobility/seating were the most common types of AT/RT equipment purchased by counselors in a 12-month time period.

Counselors who perceived AT/RT as part of their role indicated a higher level of confidence in their ability to identify and provide AT/RT services than their counterparts who did not perceive AT/RT as part of their role. This perception could relate to the counselors with AT/RT training being able to more effectively manage AT/RT services, thus observing more positive outcomes. Given that the goal of VR is employment, the perception of utilizing AT/RT for employment placement and retention is especially critical to the field. Results of this study revealed no difference between male and females in their perceptions of providing AT/RT services.

CHAPTER V. SUMMARY, CONCLUSION, AND RECOMMENDATION

Chapter Four described the results of the study. This chapter will summarize the findings and offer conclusions and recommendations for further research. The focus of this study was to identify information related to vocational rehabilitation (VR) counselors' confidence in their ability to identify and provide AT/RT services and equipment, their perceptions of AT/RT as well as perceptions of their AT/RT training needs. The results of the study revealed findings for the demographic information that were in keeping with one's expectations for VR counselors. This finding suggests that many of these counselors may be retiring in the near future, leaving a gap between the number of available professionals and consumers needing services. An implication of this potential shortage provides fertile ground for VR programs to recruit prospective students into university programs to prepare as VR counselors.

Results for the first null hypothesis show a statistically significant difference in counselor confidence in identifying and providing AT/RT services and equipment for counselors who perceive AT/RT as part of their role and those who do not, $F(1, 38) = 26.64$, $p = .000$. The first null hypothesis was rejected. Findings from this study exposed no statically significant difference in counselors' perception of their confidence in identifying and providing AT/RT services based on gender. Thirteen percent of VR counselors reported they were not confident in determining the potential need for AT/RT while 38% reported they were not confident in identifying AT/RT solutions. Eighty percent of the respondents were female compared to twenty percent male, and most were white/Caucasian (75%) compared to African American (25%). All the counselors who contributed to this study held a Masters level degree. The gender and ethnicity imbalance may contribute to a lower consumer comfort level, putting some at risk for acquiring inadequate AT/RT services and equipment. This finding suggests that university

programs may want to focus efforts toward recruiting individuals of different ethnicities so as to meet the needs of a diverse consumer population.

As reflected in Table 4, most of the counselors had only one to ten hours AT/RT training. This is in keeping with findings by Riemer-Reiss (2003). Seventy-nine percent reported purchasing AT/RT services one to six times over a 12-month period, and computer access and mobility/seating combined were the most commonly purchased equipment. This finding suggests limited training for VR counselors, an infrequent number of times in providing AT/RT services, and limited types of AT/RT equipment provided. While these findings may, in fact, represent the needs of consumers, there is also the possibility that more training would broaden counselor's role perception and knowledge of various types of AT/RT equipment; thus counselors may be more confident in identifying and providing AT/RT services and equipment. Counselors indicated a lack of confidence in performing direct AT/RT activities. These activities included training consumers to use AT/RT, selecting AT/RT equipment, installing AT/RT, and modifying or fabricating equipment.

Several futuristic articles have cited the importance of AT/RT in the rehabilitation process. A study examining the status of AT/RT training in rehabilitation counselor training programs revealed that knowledge of AT/RT was seen as important or imperative by the 47 respondents; however, the majority of respondents reported that AT/RT was infused across the curriculum and not taught in a dedicated course or courses (Estrada-Hernandez, Wheaton, Dawson, & Krispinsky, 2007).

The researcher explored the related research and literature on VR counselors' confidence related to AT/RT services, perception of AT/RT, and perception of their role in the utilization of AT/RT. In order to measure the counselors' confidence of AT/RT the Rehabilitation

Technology Counselor Survey (RTCS) survey was used. In a research study conducted by Barros-Bailey, Benshoff and Fischer, 2009) findings showed that VR counselors had concerns about their role in assistive technology and developing the skills to meet the needs of a more complex client population. Implications of their answers within the emerging generational context were explored, as were ideas for future research. The literature and related research emphasize the importance of rehabilitation technology and the emergence of AT resources in the rehabilitation counseling process. Recent studies focus on specific issues in rehabilitation counseling. For example, counselor confidence is cited as a barrier to providing AT/RT to consumers (Noll, Owens, Schwanke, 2006). Common themes that emerge in the literature include professional identity issues and the need to broaden the professional stance of rehabilitation counseling; the importance of developing a more flexible service delivery system, along with the use of more evidence-based practices; and the need to expand the rehabilitation counselor education curriculum to include AT training.

Conclusion

Accommodations and assistive technology do not hold all the answers to the employment needs of individuals with significant disabilities. However, many successful employment outcomes that satisfy the expectations of the consumer, and the employer may not be achieved without the accommodations and performance enhancements that AT can provide. Without question, VR counselors who fail to consider adequately and integrate assistive technology resources and services fall short of achieving meaningful employment outcomes for a significant portion of the individuals that they serve. This study investigated the role of vocational rehabilitation counselors' in providing Assistive Technology/Rehabilitation Technology (AT/RT) for individuals to achieve their employment goal. To determine this role, counselors

working for one state VR agency located in the southeast region of the United States completed the Rehabilitation Technology Counselor Survey online to indicate their role in AT/RT. The VR Counselors' demographic and professional profiles were identified by a demographic and professional profile questionnaire developed by the researcher.

Although assistive technology is seen as important, and is codified in the Council on Rehabilitation Education, CORE Standards (2008), this study implies training programs need to be more assertive and vigorous in adding assistive technology education to curriculum. There are three rehabilitation graduate programs in this state's university system, and many VR state agency staff are graduates of these programs. There appears to be a need for these rehabilitation counselor training programs to examine the AT/RT training being provided to their students. This training should consider prioritizing competencies necessary to perform the functions noted by the VR counselors as critical functions. Examples of the VR counselor's functions related to AT/RT services include identifying the need for AT/RT, purchasing and coordinating services and providing information to consumers. An emphasis in AT/RT service-related curricula should be to develop programs that will substantiate counselor's ability to identify the need or potential benefit, from AT/RT services, including types of assistive technology and their uses in the workplace and for activities of daily living (Barros-Bailey, Benshoff, & Fischer, 2009).

The one state VR agency located in the southeast region of the United States annually sponsors its VR counselors' participation at Assistive Technology Expo and Conference, whereby professional development and training is provided in a variety of areas including AT/RT for augmentative communication, computer access, vision/hearing, cognition, and physical accessibility/mobility. Attendee representatives of the state rehabilitation program

reported having learned how to use AT/RT to help the consumers in their caseload have additional resources when needed.

Further research in this area is needed to understand the gaps and needs for improving AT/RT services in the vocational rehabilitation field. Future studies in this field should include participants from each state VR program and should tie self-reported ratings of training needs to other measures, including counseling and client outcomes and qualitative assessments of interview techniques. An examination of the relationship between counselors' self-assessment of training needs and counselors' ratings from supervisors, counselors' ratings from clients, and job performance would lend additional validity to assessing training needs.

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Appendix 1

Demographic and Professional Profile Questionnaire

I have read, understood, and printed a copy of the consent letter and choose to participate in this study.

- ● Yes
- ● No

1. What is your current age?

- ● 23 to 27
- ● 28 to 34
- ● 35 to 44
- ● 45 to 54
- ● 55 and older

2. What is your gender?

- ● Male
- ● Female

3. What is your ethnicity?

- ● White/Caucasian
- ● African American
- ● Hispanic
- ● Asian
- ● Native American
- ● Other

4. Degree(s) Earned (please indicate field or specialty)

- ● Masters in Vocational Rehabilitation
- ● Master's in Education
- ● Masters in Counseling
- ● Ph.D. in Vocational Rehabilitation
- ● Ph.D. in Education
- ● Ph.D. in Counseling

5. Are you eligible to take the CRC?

- ● Yes
- ● No

6. Years as VR Counselor?

- ● 1-5 years
- ● 6-10 years
- ● 11-15 years
- ● 16-20 years
- ● 21 or more years

7. What population of disabilities do you work with? (Click all that apply).

- ☐ Physical
- ☐ Blind and Low Vision
- ☐ Deaf and Hard of Hearing
- ☐ Cognitive
- ☐ Other

8. Specific training in AT/RT (choose all that apply)			**Number of Hours**	
Certificate Program	**1-10**	**11-20**	**21-30**	**30+**
Credit hours within a degree				
Continuing Education				
Professional In service				
AT/RT Conference				

Appendix 2

Rehabilitation Technology Counselor Survey (RTCS)

AT/RT Role:
I view my role in the following activities by answering yes or no. Then answer how confident you are in the delivery and management of AT/RT as follows:

Confident = 3 Somewhat Confident = 2 Not Confident = 1

If you answer no. Please still indicate how confident you are in the delivery and management of AT/RT.

9. Determine potential need for AT/RT

- ● Yes
- ● No

10. How confident are you in determining potential need for AT/RT

- ● Confident = 3
- ● Somewhat Confident = 2
- ● Not Confident = 1

11. Determine AT/RT solutions to be used

- ● Yes
- ● No

12. How confident are you in determining AT/RT solutions to be used

- ● Confident = 3
- ● Somewhat Confident = 2
- ● Not Confident = 1

13. Make referrals for AT/RT services

- ● Yes
- ● No

14. How confident are you in making referrals for AT/RT services

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

15. Manage provision of AT/RT services provided by specialists

- Yes
- No

16. How confident are you in managing the provision of AT/RT services provided by specialist

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

17. Purchase specific AT/RT equipment

- Yes
- No

18. How confident are you in purchasing specific AT/RT equipment

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

19. Provide consumers with information on AT/RT

- Yes
- No

20. How confident are you in providing consumers with information on AT/RT

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

21. Install AT/RT equipment

- Yes
- No

22. How confident are you with installing AT/RT equipment

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

23. Modify/fabricate AT/RT equipment

- Yes
- No

24. How confident are you to modify/fabricate AT/RT equipment

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

25. Train consumers to use AT/RT equipment

- Yes
- No

26. How confident are you in training consumers to use AT/RT equipment

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

27. Assist consumers in the selection of AT/RT equipment

- Yes
- No

28. How confident are you to assist consumers in the selection of AT/RT equipment

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

29. Document AT/RT outcomes

- Yes
- No

30. How confident are you to document AT/RT outcomes

- Confident = 3
- Somewhat Confident = 2
- Not Confident = 1

31. Refer for repair of AT/RT equipment

- Yes
- No

32. How confident are you to refer for repair of AT/RT equipment

- ● Confident = 3
- ● Somewhat Confident = 2
- ● Not Confident = 1

33. Perform AT/RT services

- ● Yes
- ● No

34. How confident are you to perform AT/RT services

- ● Confident = 3
- ● Somewhat Confident = 2
- ● Not Confident = 1

<u>Perception of AT/RT Services and Equipment</u>

(Indicate your response by choosing the appropriate number 1 through 5 on the scale for AT/RT services and equipment versus other interventions.)

35. I find the cost of AT/RT generally:

Prohibitively expensive	1	2	3	4	5	Reasonably priced
●	●	●	●	●	●	●

36. I find that AT/RT is usually:

Unreliable	1	2	3	4	5	Reliable
●	●	●	●	●	●	●

37. In my experience, the procedures involved in providing AT/RT services and equipment have been:

Full of administrative hassles	1	2	3	4	5	Clear-Direct
●	●	●	●	●	●	●

38. The providers of AT/RT services I have utilized were:

Ineffective 1 2 3 4 5 Effective

39. The consumers on my caseload need AT/RT services to meet IPE goals:

Not Needed 1 2 3 4 5 Generally needed

40. The solutions provided by AT/RT services are:

Unnecessarily complex 1 2 3 4 5 Simple, yet effective

41. AT/RT equipment provided are generally:

Abandoned 1 2 3 4 5 Used extensively

Assistive Technology / Rehabilitation Technology (AT/RT) Services Purchased and Provided by a VR Counselor:

For the following items, consider the definition of AT/RT to broadly include modified transportation, mobility and sorting, work site modification, visual and hearing related equipment, environmental controls, computer access, augmentative and alternative communication, etc. Please select the appropriate response for the following statements for the last 12 months.

42. I refer ___ # of consumers a year for AT/RT services.

0 1-10 11-20 21-30 30+

43. I provide AT/RT services to ___ # consumers per year.

0 1-10 11-20 21-30 30+

44. I typically purchase AT/RT services from ___ # AT/RT service providers per year.

0	1-3	4-6	7-10	10+
●	●	●	●	●

Please check the types of AT/RT services and/or equipment you purchased over the last 12 months. (Check all that apply): Please check if you need/desire training in a specific AT/RT Category. Please check none if you didn't purchase any AT/RT services or equipment.

45. Augmentative and Alternatives Communication

Purchased Equipment	Purchased Services	Need/Desire Training in Equipment	Need/Desire Training in Services	None
☐	☐	☐	☐	☐

46. Computer Access

Purchased Equipment	Purchased Services	Need/Desire Training in Equipment	Need/Desire Training in Services	None
☐	☐	☐	☐	☐

47. Workplace Modifications

Purchased Equipment	Purchased Services	Need/Desire Training in Equipment	Need/Desire Training in Services	None
☐	☐	☐	☐	☐

48. Sensory-Related AT

Purchased Equipment	Purchased Services	Need/Desire Training in Equipment	Need/Desire Training in Services	None
☐	☐	☐	☐	☐

49. Mobility/Seating

Purchased Equipment	Purchased Services	Need/Desire Training in Equipment	Need/Desire Training in Services	None
☐	☐	☐	☐	☐

50. Transportation

Purchased Equipment	Purchased Services	Need/Desire Training in Equipment	Need/Desire Training in Services	None
☐	☐	☐	☐	☐

51. Other AT/RT

Purchased Equipment	Purchased Services	Need/Desire Training in Equipment	Need/Desire Training in Services	None
☐	☐	☐	☐	☐

Appendix 3

Participant Recruitment Letter

Dear Vocational Rehabilitation Counselors,

I am a graduate student in the Department of Special Education, Rehabilitation and Counseling at Auburn University. I invite you to participate in this research study to determine the perception vocational rehabilitation counselors have regarding assistive technology/rehabilitation technology. You may participate if you are at least 19 years old and working as a vocational rehabilitation counselor for the Alabama Department of Rehabilitation Services.

Participants will be asked to complete a Demographic and Professional Profile Questionnaire and the Rehabilitation Technology Counselor Survey online through a provided link. The questionnaire will take approximately 15 minutes to complete. The demographic and professional profile questionnaire has 9 questions. It will take approximately five minutes to complete. The Rehabilitation Technology Counselor Survey (RTCS) has 44 questions. It will take approximately 10 minutes to complete.

The goal of this study is to determine the perceptions vocational rehabilitation counselors have regarding assistive technology/rehabilitation technology and to identify AT/RT training needs, which will lead to providing individuals with significant disabilities more options to assistive technology /rehabilitation technology in order to gain competitive employment. There are no anticipation that there will be risks or discomforts associated to the study, because the data is being collected anonymously. If you would like more information about this study, an information letter can be obtained by clicking on the attachment in this e-mail labeled "Electronic Information Letter of Informed Consent – Rehabilitation Technology Study". If you decide to participate, you may access the survey from the link in the attached informed consent letter.

If you have any questions, please contact me via e-mail at rennesr@auburn.edu or my advisor, Dr. E. Davis Martin at martiev@auburn.edu.

Thank you for your consideration,

Scott Renner

Scott Renner, MSW

Appendix 4

Electronic Information Letter of Informed Consent

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

INFORMATION LETTER
for a Research Study entitled
"Vocational Rehabilitation Counselors Perceptions of Assistive Technology/Rehabilitation Technology"

You are invited to participate in a research study to determine vocational rehabilitation counselors' perceptions regarding assistive technology/rehabilitation technology. The demographic and professional profile questionnaire and the RTCS is an instrument developed to conduct research on vocational rehabilitation counselors working for one state vocational rehabilitation program. . The study is being conducted by Scott Renner, a graduate student under the direction of Dr. E. Davis Martin, Department Head and Professor in the Auburn University Department of Special Education, Rehabilitation and Counseling. You were selected as a possible participant because you are a vocational rehabilitation counselor providing vocational rehabilitation services to Alabamians with disabilities and are age 19 or older.

What will be involved if you participate? Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete a survey assessing the confidence vocational rehabilitation counselors have regarding rehabilitation technology and complete a demographic professional profile information questionnaire. Your total time commitment will be approximately 15 minutes.

Are there any risks or discomforts? The risks associated with participating in this study are none because the research will not use any deception.

Are there any benefits to yourself or others? If you participate in this study, you can expect to help the researcher examine the confidence vocational rehabilitation counselors have regarding rehabilitation technology. The researcher is also collecting demographic professional profile information of vocational rehabilitation counselors working for the Alabama Department of Rehabilitation Services.

Will you receive compensation for participating? No

Are there any costs? If you decide to participate, you will not incur any costs.

If you change your mind about participating, you can withdraw at any time by closing your browser window. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Once you've submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not

jeopardize your future relations with Auburn University or the Department of Special Education, Rehabilitation and Counseling or the Alabama Department of Rehabilitation Services.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by collecting it anonymously and downloading the data onto the researcher's and statistician's computers which are password protected. After the study is completed, the electronic data will be destroyed. Information collected through your participation may be used to fulfill an educational requirement, published in a professional journal, and/or presented at a professional conference.

If you have questions about this study, please contact Scott Renner by e-mail at rennesr@auburn.edu or phone (334) 844-5226 or Dr. E. Davis Martin by e-mail at martiev@auburn.edu or phone (334) 844-7676.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE LINK BELOW. YOU MAY PRINT A COPY OF THIS LETTER FOR YOUR RECORDS.

Scott Renner November 19, 2014

Investigator Date

"The Auburn University Institutional Review Board has approved this document for use from November 17, 2014 to November 16, 2107. Protocol #14-493 EX 1411."

Link to Rehabilitation Technology Counselor Survey
https://auburn.qualtrics.com/SE/?SID=SV_cJhNG6ZKJhgjbCZ

Appendix 5

Participant Reminder Letter

Dear Vocational Rehabilitation Counselors,

You received an email two weeks ago inviting you to participate in a research study to determine the perception vocational rehabilitation counselors have regarding assistive technology/rehabilitation technology. If you have not completed the survey and would like to participate in the research study please complete the survey by 1 week.

You are asked to complete a Demographic and Professional Profile Questionnaire and the Rehabilitation Technology Counselor Survey online through a provided link. The questionnaire will take approximately 15 minutes to complete. The demographic and professional profile questionnaire has 9 questions. It will take approximately five minutes to complete. The Rehabilitation Technology Counselor Survey (RTCS) has 44 questions. It will take approximately 10 minutes to complete.

The goal of this study is to determine the perceptions vocational rehabilitation counselors have regarding assistive technology/rehabilitation technology and to identify AT/RT training needs, which will lead to providing individuals with significant disabilities more options to assistive technology /rehabilitation technology in order to gain competitive employment. There are no anticipation that there will be risks or discomforts associated to the study, because the data is being collected anonymously. If you would like more information about this study, an information letter can be obtained by clicking on the attachment in this e-mail labeled "Electronic Information Letter of Informed Consent – Rehabilitation Technology Study". If you decide to participate, you may access the survey from the link in the attached informed consent letter.

If you have any questions, please contact me via e-mail at rennesr@auburn.edu or my advisor, Dr. E. Davis Martin at martiev@auburn.edu.

Thank you,

Scott Renner

Scott Renner, MSW