

INTRODUCTORY GUIDE TO ASSISTIVE TECHNOLOGY FOR EDUCATORS

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Introduction

Background

Upon writing my thesis, I wanted to work on professional development skills. Professional development skills are not only vital for the growth of educators, but also extremely beneficial for students. When deciding to complete an undergraduate thesis, I researched the licensure standards which special education instructors must maintain when obtaining their initial license. The license guidelines are written by the Council for Exceptional Children (CEC) and include the following program standards: Learner Development and Individual Learning Differences, Curricular Content Knowledge, Assessment, Instructional Planning and Instructional Strategies, Learning Environment, Communication and Collaboration, and Professional Learning and Ethical Practice. I felt as though I had a deficit in the last skill; therefore, I opted to complete this document to educate myself about the process of professional learning. Additionally, as a future educator, I need to be familiar with assistive technology and the implications in the classroom. My background knowledge was limited to bulky and expensive devices that were solely used for the student's absolute necessities, such as wheelchairs and walkers for their mobility and iPads for their communication. As a result, I decided to begin writing an undergraduate thesis on assistive technology for individuals with disabilities to further my knowledge as a future educator.

Methods of Research

In order to familiarize myself with the use of assistive technology in today's classrooms, I researched the topic in a multitude of ways. I read research articles and up-to-date websites, discussed the topic with current teachers, witnessed the use of assistive technology in classrooms, and comprehend the implementation of assistive technology from my professors. Initially, I began my research by finding scholarly reviewed essays at the library and online. Prior to writing this document, I was unfamiliar with this process. I encountered many research articles that were specific regarding types of disabilities and types of assistive technology devices. As a result, I had difficulties generalizing how I would use these devices as a future educator. Additionally, to complete research on the students, it was imperative that the studies were ethical. This often limits the number of students who can participate in the research study, as professionals must know the device will benefit the student in advance of the study.

To combat this weakness, I chose to go into the field and witness how current instructors were utilizing assistive technology. I visited three classrooms; two classrooms were elementary classrooms and one was a middle school classroom. By observing how instructors implemented assistive technology, I was able to determine that often the devices that were the smallest and least expensive were more advantageous. The devices the students were able to use both independently and to better access their environment were often the most useful. In order to preserve the students' and teachers' confidentiality, I have not included their names or specific examples from the

classroom. Instead, I have chosen to discuss the most common and beneficial uses of devices and modifications I saw in the field.

Finally, I completed my research by consulting my professors regarding the use of assistive technology. As I began this discussion, it strengthened my relationships with them and my ability to communicate with others that I had previously struggled with as an undergraduate. Many of my professors were K-12 teachers in the past. As a result, their views helped me to craft this document. Their ideas were creative and often did not require expensive, difficult to find items to use as tools in their classroom.

Use for All Educators

Not only is the purpose of this guide for my own professional development, but it is also for the growth of other educators. Now, more than ever, individuals with disabilities are being placed in general education classrooms. This is often confusing and scary to teachers who are unfamiliar with instructing individuals with disabilities. Assistive technology helps students access their education, but it also assists instructors differentiate instruction. Although initially educators may be reluctant to adapting assistive technology into their classroom, they will soon realize that it can save time and the need for additional remediation.

Environments of Use

This document discusses the use of assistive technology in the educational setting. The use of a new device needs to be taught to the student, parent, and educators, as the device can be used outside of the classroom. The device should be socially

appropriate for the student's ability and their age, as well as transferable into multiple settings, such as their in a recreational and leisure activities, a job, and home. In order to successfully complete this task, an individual must be instructed how to operate the device, when the use of the device is applicable, and the deficit he has that makes the device necessary. This creates a self-awareness that is necessary to transfer the skill to multiple environments.

Decision-Making

According to the Individuals with Disabilities Education Act (IDEA), students must be provided with the appropriate means to accessing their education by educators. As a special education teacher, it is necessary to evaluate students in order to determine the devices they may require for their needs. Occupational therapists, speech-language pathologists, and other professionals may help with assessing students' needs, but essentially the special education teacher is in charge of establishing the need for an assistive technology device.

Although IDEA determines that students with disabilities must be given devices that help them access their education, it is the educator's job to provide judgment on the cost. For example, using yellow paper for a student with a visual impairment is cheaper than buying paper specifically for an individual with visual impairments. Additionally, the teacher must ascertain when one device is needed over another. One must determine if the device has a specific function the other does not have, if the device is more

dynamic and accessible in other environments, and will the device be more socially acceptable.

According to the National Institute for Educational Statistics in 2015, over 6,401,000 students in the United States were receiving special education services in one year, which is approximately two percent of our country's total population (NIES, 2015). As a result of that number being so substantial, the government and school systems have evolved teaching methods, laws, and funding to instruct students of all needs. Over the years the term "special education" has developed from a classroom for people with disabilities, to a place in which children that are different than their peers can learn and flourish as individuals. This would not be possible, without the advancement of technology.

Initially, students with special needs were placed in asylums or mental hospitals due to the fact that there was little information regarding the instruction and the future of individuals with disabilities (Hulett, 2009). With the passage of time, therapists and teachers have developed methods to successfully assist students with any disability attend school. The impetus to the inclusion of people with disabilities into traditional schooling is technology. As technology has progressed, individuals with disabilities have benefited tremendously by having new accommodations and modifications. This has changed the way educators view special education students within their classrooms, as now curriculum can fit all students' needs.

Purpose

Today, special needs educators must provide free and appropriate education in the least restrictive environment for people identified with disabilities. This means that students with disabilities must be placed, as often as possible, in a learning environment with peers who do not have disabilities (Hallahan, Kauffman, & Pullen, 2011). Each student identified with special needs has an individualized program called an Individualized Education Plan (IEP) written in order to specify the student's yearly goals as well as anything a child may need to receive to have a successful time at school and anything that may be necessary for the child's future (Bateman, 2006). The plan lays out any services the student may need such as speech therapy or physical therapy (Bateman, 2006). Additionally, the plan outlines accommodations and modifications made possible by technology.

By utilizing technology, special needs educators can adjust lesson plans to all students needs. When a teacher is writing his lesson plans, he can adapt changes for specific students. For example, if a student has a visual impairment, the teacher may make a note to make copies of handouts in larger fonts to allow the student to read with ease. Although this may seem like a trivial change, years ago this was not possible. The teacher would have spent additional time making a different version for students with visual impairments. As a result, these modifications allow a student who would have been in a special education class to spend more time in a general education classroom with his peers (Bateman, 2006). As a result, this improves inclusion of children with

special needs in general education, providing more opportunities for students with and without disabilities.

Special Education Law

There are specific laws that ensure that individuals with disabilities receive proper education. The Rehabilitation Act of 1973 facilitates the necessary services or changes to a learning environment that a student may need in order to access his education (Hullet, 2009). If a school cannot provide an appropriate education for a student, the school must provide an alternate free and suitable location for the student's education (Hullet, 2009). Furthermore, the law states that an individual with a disability is, "any person who (i) has a physical or mental impairment which substantially limits one or more of such person's major life activities, (ii) has a record of such an impairment, or (iii) is regarded as having such an impairment."

Moreover, special education is governed by the Individuals with Disabilities Education Act (IDEA) of 1990, which legally specifies the responsibilities schools play for individuals with disabilities (Turnbull et. al, 2011). Under IDEA students are given six key rights which include: free and appropriate public education, appropriate evaluation, zero rejection, placement in the least restrictive environment, parent participation in placement, and procedural safeguards (Turnbull et. al, 2011). Public schools must provide free education for students with disabilities or provide free placement in an alternative setting (Turnbull et. al, 2011). The student must be evaluated yearly to guarantee his placement and services received are accurate, in his native language by a valid assessment. Furthermore, schools may not exclude a child from

education due to severity of behaviors or the extent of the exceptionality. Moreover, schools must make accommodations and modifications in order to guarantee that a student is receiving adequate education in their least restrictive environment (Florida Department of Education, 2015). Students should be with their typical, non-special education, peers as often as possible (Hallahan et al, 2011). Parents must be alerted of changes in their child's curriculum, know when their child is assessed, and be invited to meetings regarding their child's progress. Finally, IDEA mentions due process, in which protect the student and family's rights under the federal law. By putting these procedures in place, parents have access to their student's progress until the age of 18, as well as students and parents have the right to a mediator during evaluations.

Additionally, students who are identified with a disability have a yearly IEP written by a team of professionals. The special education teacher, district representative, parents, general educator, any additional services such as occupational therapist or speech therapist, and the student write the IEP when he becomes 14 years old (Hulett, 2009). Additionally, the state of Ohio mandates that when the student is 16 years old, a transition plan is written. An IEP contains measurable goals and objectives for the student to complete by his next evaluation (Hulett, 2009). This includes transition statements for the student's future career and independence. Also, the IEP includes any changes to the typical curriculum that the student needs in order to flourish academically, socially, and developmentally. As a result, any accommodations are added to his IEP (Hulett, 2009). This includes any assistive technology. Often students with special needs are accommodated with assistive technology so that they can remain with their typical

peers during a portion and up to a full day of school. Assistive technology allows the student to work on his individual goals privately, while often not disrupting other students in the classroom. As a result, other students can work on separate tasks and lessons, while the student is working on a lesson that is differentiated for his needs. Both laws state that any assistive technology that has been deemed necessary by a student's IEP team must be provided to the student by the school. Typically, assistive technology is used to ensure that a student is receiving appropriate education in a least restrictive environment. This allows teachers to differentiate instruction for students in different settings. Assistive technology also allows students with disabilities to access the general curriculum with modifications and accommodations. This should be determined on a case-by-case basis, as each student with a disability will require different types of support. In the later sections, we will discuss some general types of technology that can be used for students with specific disabilities. It is necessary to discuss the usage of assistive technology with the IEP team before implementing new strategies.

Low and High Assistive Technology

Assistive technology is divided into two distinctive divisions: low technology devices and high technology devices. Low technology devices do not utilize any power source, whereas high technology devices require a power source such as electricity or a battery (Okolo, 2014). A few examples of low technology devices include: Velcro, pencil grips, and ramps. Each of the devices listed allow individuals with motor or fine motor impairments to perform tasks such as tying their shoes or using a pencil with ease. On the other hand, it is believed that high technology devices are expensive due to the fact that they need a power source to function. Contrary to belief, high technology devices do not need to be costly, as batteries can be inexpensive. An example of a low expense high technology device would be a tape recorder. The student would review the lecture by listening, rather than studying notes. A student with dyslexia could utilize a tape recorder in order to study lectures. On the contrary, an iPad would be a more expensive high technology device that the student could also take advantage of to record lectures. Examples of high technology devices include: computers, wheelchairs, and books on tape.

Defining Specific Disabilities

In order to understand the importance of technology utilization with individuals with special needs, it is vital to define the most prevalent disabilities in classrooms. Today, approximately one in every twelve children will have a special need different than his peers (Hallahan et al, 2011). This will cause students to need differentiated instruction in either a resource room, smaller groups in general education, or a special education classroom (Hallahan et al, 2011). Throughout the next sections, I will define six major categories of disabilities as well as common symptoms of the disabilities that could lead to the utilization of assistive technology.

Autism

Autism Spectrum Disorder is an ever-changing disability in which it is characterized with difficulties in socializing, communication, and repetitive behaviors. Autism Spectrum Disorder is an umbrella disorder, which is defined as a spectrum disorder where each person with autism displays different symptoms (Hallahan et al, 2011).

Autism Spectrum Disorder is a disorder characterized by impairment in social communication, repetitive behaviors, and/or delay in communication skills (Hallahan et al, 2011). The following symptoms must be present: “impaired communication, impaired social interaction, substantial impact on life function, and present in early childhood” (Hallahan et. al, 2011). Individuals with ASD have a distinct way of thinking including, differences in: “concepts of meaning, focusing on details, concrete-abstract thinking, organization and sequencing, generalization, concept of time and, combining and

integrating ideas” (Yildirim, 2013). There is no known cause of Autism Spectrum Disorder, but scientists know that genes and the environment effect the development of Autism (Hall, 2009). Autism Spectrum Disorder co-occurs 40-60% of the time with intellectual disorders (Hallahan et. al, 2011).

Today, about 1 in every 68 babies are born with autism spectrum disorder, with a greater prevalence in males than females (Hall, 2009). As a result, teachers in general education and special education are working more with individuals with Autism Spectrum Disorder, PDD-NOS, and Asperger’s Syndrome. Special needs educators’ work with individuals on the Autism Spectrum and focus on communication, social goals, and often-problematic behaviors (Hallahan et al, 2011). By utilizing assistive technology, individuals with autism can be more successful within school.

Learning Disabilities

Learning disabilities are a problem within “academic functioning” (Yildirim, 2013). In order to alleviate learning disabilities, many educators use assistive technology. As of 2011, about five percent of all American students receive services from schools for learning disabilities (Cortiella et. al, 2014). This is the largest disability category in schools, as this makes up forty-one percent of students identified need special education services (Bakken et. al, 2013). According to the National Joint Committee on Learning Disabilities, “Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities” (Cortiella et. al, 2014). These difficulties are a result of central nervous system development. Learning

disabilities do not define an individual's intelligence or ability to think, although students will have a more difficult time with comprehending a specific subject or concept. Learning disabilities and intellectual disabilities are different, as learning disabilities refer to a person's difficulty comprehending one or more subject. Each state has different percent cut-offs based on standardized assessments for students to receive special education services.

Intellectual Disabilities

Intellectual disabilities are disabilities that significantly limit a person's "adaptive behavior and intellectual functioning" that are present before the age of eighteen (Yildirim, 2013). Intellectual disabilities can be caused by prenatal, perinatal, or postnatal factors. A few possible origins are environmental causes, such as low birth weight, and meningitis (Hallahan et. al, 2011). IQ tests can determine an individual's intellectual functioning level. A typical IQ level is 90 to 110. The level 50 to 70 on an IQ test identifies an individual with mild intellectual deficits (Hallahan et. al, 2011). The level 35 to 50 on an IQ test means an individual with moderate intellectual deficits (Hallahan et. al, 2011). The level 20 to 35 on an IQ test identifies an individual with profound intellectual deficits (Hallahan et. al, 2011). The level below a 20 on an IQ test identifies an individual with profound intellectual deficits (Hallahan et. al, 2011). An IQ score does not define the capabilities of a student; thus, it is vital not to limit a person based upon a test score. Adaptive behaviors are skills in which help a person live his daily life. These include: "conceptual adaptive skills [such as seeing patterns], social adaptive skills [such as making friends], [and] practical adaptive skills [such as preparing

food]” (Yildirim, 2013). In school, special needs educators will teach life skills to people with Intellectual Disabilities using extended state standards. The practice of adapting general education standards to teach practical life skills will benefit the student after the conclusion of his schooling.

Communication Disorders

Another disability frequently identified in schools is communication disorders. According to the Individuals with Disabilities Education Act (IDEA), communication disorders are defined by a “speech or language impairment means a communication disorder such as stuttering, impaired articulation, a language impairment, or a voice impairment that adversely affects a child's educational performance.” Communication disorders can either be speech impairments or language disabilities.

According to the Speech and Hearing Association, speech impairments are verbal impairments of “fluency, voice, or articulation.” A few types of speech impairments include stuttering, apraxia, and dysarthria. This affects how the speaker is able to speak, but these disorders do not affect comprehension of language.

On the other hand, individuals with language disorders have problems in either comprehension of language, expression of language, or both. Language disorders can either be primary or secondary. Primary language disorders have no known cause (Yildirim, 2013). On the other hand, secondary language disorders are the result of another disability or disorder. Individuals with language disorders may have difficulties with reading, socializing, and behavior as a consequence of the inability to properly comprehend or express language.

Motor Disabilities

Another group of individuals with disabilities that utilize assistive technology resources are those with motor disabilities. Motor disabilities are disabilities in which physical functioning is impaired. Individuals with motor disabilities may have: cerebral palsy, motor coordination disorder, traumatic brain injury, and central nervous system injuries. Students with physical disabilities may receive occupational therapy or physical therapy. Occupational therapists focus on fine motor skills necessary for daily living skills and independent living skills. Some skills may include handwriting, brushing teeth, and washing hands. On the other hand, physical therapists focus more on gross motor movement and muscle usage such as running, hopping, and jumping. Typically physical therapists focus on mobility. Individuals with physical impairments need assistive technology to live their day-to-day life. This could include walkers, wheelchairs, canes, standers, and other adaptive motor devices. Assistive technology allows students with physical impairments to either be integrated into general education, or to be placed with their typically developed peers.

Other Health Impairments

The final group of disabilities this paper will discuss are classified in the Individuals with Disabilities Education Act as “other health impairments.” In the legislation, other health impairments is used to refer to individuals who, “have limited strength, vitality, or alertness, including a heightened alertness to environmental stimuli, that results in limited alertness with respect to the educational environment, that is due to chronic or acute health problems and adversely affects a child’s educational

performance.” For this thesis, I will concentrate on two major health impairments: seizure disorders and deathly allergies.

Typically, an IEP will not be written solely for a seizure disorder or allergy, but these health problems co-occur with other disabilities. Seizure disorders are a disorder of the brain in which the brain nerve cells are disrupted, thus causing involuntary convulsions, moments of confusion, fainting, and amnesia. As a result of seizures, a student’s learning may be affected, as he may not comprehend the teacher. The student may be placed in special education or an intervention room for extra support. In order to catch-up academically, students may use assistive technology. Additionally, a person with epilepsy may use assistive technology to time the length of seizures and alert others.

Another “other health impairment” that is common in today’s classrooms are allergies, specifically those that are food related. Today, over 15% of all students in public education will have a food allergy (F.A.R.E, 2015). As a result, it is necessary to examine ways to accommodate students with allergies and keep classrooms safe of common food allergens such as tree nuts. Students can apply assistive technology to reduce the exposure to allergens.

Assistive Technology Examples for Each Disability

For each of the disabilities listed above, I will focus on specific technology examples. General educators and special needs educators can use this section to help their students find assistive technology specific to their disability. Assistive technology can be used to modify or accommodate a student's needs, and its use must be noted in their IEP and specify if the device will be a modification or accommodation to general education. This allows general educators, substitute teachers, and all other educators within the educational system to have the knowledge of the accommodations and

modifications the student is receiving. Accommodations help students learn the same material, but in a different way. As a result, the student is expected to meet the same goals as their peers. An example of an accommodation would be giving a student extra time on an exam. Modifications are changes to the curriculum. An example of this would be shortening an exam or changing the material learned in a subject.

Accommodations are made to students who are struggling but may be able to be at the same level as their peers with the accommodation, whereas modifications are typically made when a student is significantly behind or cannot perform at the same level as their peers. The examples of assistive technology devices listed below are not the only devices available. Research and development of new technology is being done daily. As a result, it is important to remain up-to-date on new advancements for students.

Assistive Technology Usage in Autism Spectrum Disorder

Students with Autism Spectrum Disorder may use assistive technology for a multitude of reasons. As previously stated individuals with autism are on a spectrum, thus technology accommodations may differ among students. Some students may not need assistive technology, whereas others may rely on it in a general education setting. Students with Autism Spectrum Disorder may use assistive technology for social skills support and behavioral accommodations.

Social skills are an integral lesson taught during school. There are a few different assistive technology devices available for individuals who are struggling to grasp social communication and interactions. The first device is a low technology device called social stories. Social stories are stories regarding various situations to help a student learn more about a specific interaction (Web Accessibility Initiative, 1999). For example, if a student is struggling with introducing himself, a social story may be created. The story will use positive language to promote appropriate behavior (Flores, 2014). There are programs online such as ConnectABILITY, and Pogo Board to help educators create stories. The stories should be read with the student prior to the occurrence of the situation. On the other hand, an educator may decide to use a higher technology device in which the teacher or peer records a social story on a technology device such as an iPad or Chromebook, known as video modeling. This is especially useful for students who need to review the story multiple times. Utilizing a recording feature may also be beneficial for teachers with multiple students in their classroom as the student can replay the scenario without asking the teacher to reenact the social story. Another low technology device a teacher can utilize is a social script. This tool is an actual written script in which students read with a teacher or a peer (National Autism Society, 2015). The situation is repeated until the student proves proficiency. The program Story Builder can create social scripts for students struggling with situations such as understanding emotions or how to act in the library.

Individuals with Autism Spectrum Disorder may also use assistive technology for behavioral supports. A student with Autism Spectrum Disorder may need additional

auditory or visual supports. A low technology device that can be utilized is a visual schedule. This can be as simple as pictures or words that tell a student what activity is next. A student may need a visual schedule if he has problems with transitions between activities. A few software companies make visual schedule templates including: Picture Planner and Therapics.

Furthermore, students with Autism Spectrum Disorder may also include a task analysis as a helpful tool. A task analysis provides a break down list of what to do to complete a task. Students must follow the list in order to complete the task given (Parker & Kamps, 2010). This makes the task simpler as it is divided into parts. A teacher can write a task analysis or find prewritten task analyses online (Parker, et. al., 2010). This may be useful for a student who does just not understand a task such as writing his name on a piece of paper, or getting organized for class.

Visual timers are high technology devices in which students can visualize the amount of time left within the activity (Parette, 2007). This alleviates the anxiety of having a teacher count down verbally, as the student can see the time remaining in the activity. Companies like Time Timer and Time Tracker create physical timers, whereas devices such as iPads and Chromebooks come with a timing application on the device already.

Another device students may need for behavioral assistance are break cards. These are low technology devices that are simply pieces of paper, which read the word “break” or phrase, “I feel frustrated and I need a break.” An educator may select this as a device if a student often becomes flustered or overwhelmed with work (WATI, 2009).

Assistive Technology Usage with Learning Disabilities

Individuals with learning disabilities use assistive technology for different purposes, with some examples including catch up intervention resources, adapted learning materials, and additional assistance for the struggling student. The assistive technology can be utilized inside and outside school to reinforce the subject area the student needs extra support on a more regular basis. It gives the family a new resource to strengthen and support their child's learning.

Catch-up intervention resources include tools such as iPads, computers, and software that would be installed on a computer to allow a student to catch-up in a subject to his grade level (Rasinski, 2013). The interventions typically are utilized in reading and mathematics. A student would either use time in the classroom to work on this material, or frequent a special education or intervention specialist room to receive assistance with the catch-up intervention resource (Rasinski, 2013). A teacher may decide to use catch-up intervention if a student is significantly behind in solely one subject. Programs like Project Read, Alphabetic Phonics, and The Wilson Reading Program provide digital catch-up intervention alongside worksheets. The training for interventions are provided with each program on their website or in the catalog when the program is delivered.

Students with learning disabilities need adapted materials to help them progress in academics and organization. This could be something simple like changing the color of the worksheet paper, or enlarging the font. Changing the color of paper helps students whom are behind in reading discriminate the text and follow along easier. An instructor may also want to enlarge the font and double space the text so a student can follow along

with his finger. Additionally, another low technology device a teacher may use is a blank sheet of paper to cover line by line of text to help students focus on one sentence. A teacher will want to use this if long paragraphs or chapter books easily distract a student.

An additional assistive technology a student may receive is extra support tools. This could include educational games that are high technology or low technology. One tool could be a graphic organizer. These are low technology devices that help students organize their thoughts, as some students with learning disabilities struggle with beginning an assignment. A teacher can start the graphic organizer with incomplete phrases to help the student begin. The teacher could also provide a word bank with key words that the student should use in his assignment.

A student may use manipulatives or a calculator to complete his mathematics work (Bouck, 2009). Manipulatives help students visualize mathematical situations on paper. This can include coins, blocks, counters, chips, or base ten blocks. As a result, of using manipulatives, students are able to explain their strategies to the instructor. This practice can demonstrate to the teacher where the error has occurred (Bouck, 2009). A student may also use a calculator as an accommodation. Using a calculator does not change the course work, but rather helps students focus on the strategies being taught instead of the calculations. Accommodations such as using a calculator should be noted in the students IEP for future educators (Bouck, 2009).

A student may also use speech synthesis, voice recognition programs, and text-to-speech devices. These high technology devices recognize speech as well as read text audibly to students, such as software that include: Bookshare, Learning Ally, Dragon, and

See.Touch. Learn. Software can be downloaded to iPads, Nexus tablets, Kindle Fires, and other technology devices. In order to decide which device to use, the IEP team alongside a speech and language pathologist must first decide if the device is a necessary accommodation. Then, the team will go through a process deciding which device would be the most appropriate and allowing the student to try the different options. Text-to-speech and voice recognition make education more accessible to students with reading difficulties. As a result, students can focus on the academic content such as in science rather than reading the material given (Forgave, 2002). Additionally, these tools assist students to write in a clearer manner by helping students organize their thoughts. As a student increases his ability to do tasks in reading in writing, his motivation will also increase (Forgave, 2002)

Assistive Technology Usage with Intellectual Disabilities

Students with intellectual disabilities are capable of learning the same topics as their peers with the use of assistive technology. Often students with intellectual disabilities have modified curriculum, or a change in the general curriculum. As a result, educators use assistive technology to teach curriculum as life skills. Life skills help students prepare for living in the community and working in a career. These skills taught in classrooms and life skill classes help individuals with intellectual disabilities become more autonomous as many individuals may live in group homes, with their families, or independently. Examples of these skills include: payments for goods during math or reading a newspaper with current events during language arts. There are many assistive technology devices that can be used to modify curriculum for students with intellectual

disabilities. A few examples include guidance systems and assistance devices in life skills.

Tools a student with intellectual disabilities may use to accommodate the curriculum are guidance systems. Guidance systems help individuals travel from one place to the next. This can help the individual develop independence by learning to walk to various locations independently, or utilize public transportation to reach the desired destination.

The last assistive technology device that has been found beneficial for individuals with intellectual disabilities are different assistive devices to facilitate with life skills. These devices can be reminders on cell phones, calculators, iPads, or other modifications that help individuals live their day-to-day life. For example, an individual with an intellectual disability may use a calculator when shopping in a grocery store to stay on budget. Other assistive devices may assist individuals with writing checks, reminders regarding important events, or using a calculator to balance their checkbook. These devices can be high technology or low technology, and allow individuals with intellectual disabilities to live their lives more independently.

Assistive Technology Usage with Communication Disabilities

Speech and language pathologists commonly treat children and adults communication disorders; however, the people associated with the individual who has the speech and communication disorder must reinforce the techniques taught by the speech and language pathologist. There are a variety of tools an individual with a communication disability may use including communication buttons, communication

icon notebooks, communication devices, and visual supports. Schools must cover the expense of repairing damages to devices as well as educating the team that will work with the student and device. It is vital to find a device that will grow with the student, as often the devices are costly to replace

Communication buttons are low technology devices that can be used with students who have little to no verbal communication and multiple disabilities (Sigafos, 2004). These devices are often called BigMack Communication devices.

Communication buttons are a way for students to verbalize a desire or set phrase by touching a button (Sigafos, 2004). An educator may select this device for a student who is having a difficult time verbalizing demands or initializing social communication. The button is easy to use, as the educator records a phrase. The student then presses the button to verbalize his need.

Communication icon notebooks are low technology devices in which students can use to communicate. The notebook includes pictures taped with Velcro. This allows students to communicate non-verbally (Charlop-Christy, 2002). When the student communicates, he removes the Velcro icon to show what he is saying (Charlop-Christy, 2002). If a student is struggling to verbally communicate, this is an ideal solution as the student can start with one icon and build his icon and word vocabulary. There are many companies who offer picture icons, but Picture Exchange Communication Systems, PECS, has created its own system of communication as well as education for professionals working with picture icons (Bondy& Frost, 1985)

Communication devices can vary and some can be high technology devices. They may include words or pictures. The student will either select the icon he wants to say or type the word. As a result, the device will say the word out loud. This will help the student build his vocabulary. In order to select the proper device, the IEP team will meet to assess the student's needs as well as consult with a speech and language pathologist. If the family would like the device covered under Medicaid, the student must follow this process.

The last main communication devices are visual supports. These can be placed throughout the classroom or home of the student. Visual supports alleviate anxiety while helping a student ask what is occurring in his schedule or helping him determine what to do. These can be as simple as signs instructing the student to complete the task, and then it will be lunchtime, or more complicated such as pictures of clocks noting the hour different rotations occur.

Assistive Technology Usage with Motor Disabilities

Individuals with motor disabilities utilize assistive technology to physically access the world around them. The tools utilized by individuals with motor disabilities help create independence. These devices may be introduced by an occupational therapist or a physical therapist, but should be reinforced by everybody within the individual's life. An individual with physical impairments may experience a variety of difficulties. As a result, the individual may use assistive technology for mobility, sensory needs, eating, fine motor skills, and other necessary skills.

First, an individual with a motor disability may use technology for mobility purposes. This could be a cane, walker, wheel chair, or specific seating cushion for the individual. Students will work with an occupational therapist and physical therapist to determine the proper assistive technology device for their mobility. Each of the accommodations is made for the individual to improve their performance in his environment each day. Additionally these devices may be high technology or low technology. Individuals with mobility troubles may need a sliding board to slide on and off of a wheel chair to prop on and off of a toilet, chair, or other piece of furniture. Individuals with motor disabilities utilize ramps as an accommodation to stairs.

Next, individuals with motor disabilities may use assistive technology for sensory stimulation. Sensory stimulation may be utilized for other disabilities such as Autism Spectrum Disorder, intellectual disabilities, and behavioral disorders. As a result, the individual may use a variety of tools to receive sensory stimulation that he may be missing. These tools may include: a body sock, weighted vest, lap weights, and swings. Body socks, weighted vests, and lap weights are low technology devices and provide pressure on the individual's body. This provides a calming sensation, often stopping or preventing problematic behaviors. A swing provides movement while making the individual feel weightless.

Additionally, individuals with motor disabilities may use assistive technology to help with eating. These tools are adapted to help the individual eat independently or eat with less assistance. Individuals with motor disabilities may use angled and weighted utensils as an adaptation. The angled utensils help individuals with poor fine motor skill

and grasping difficulties, whereas the weight of the tool lessens tremors as the food is being placed into the individual's mouth. Utensils or cups may also have straps attached for the individual to wrap around their four fingers. This allows the person to use the weight of their whole hand and ensures the dishware will not fall. Finally, individuals with motor disabilities may use a universal cup or dishware with larger rims and ridges. This adaptation allows the bowl to catch any food, rather than on the person, creating independence.

Furthermore, individuals with motor disabilities may use assistive technology to help with fine motor skills such as with writing and cutting. By using assistive technology, individuals are able to be independent. For example, individuals who are unable to grip a pencil may start out using a pencil grip to solidify the way to hold a pencil. Bolts may also be placed on the pencil to weigh it down if the student is having difficulty pressing down hard enough on the paper. Additionally, the individual may use a slanted board to complete his work. This is a wooden board or hard surface that the student can write on or read on an elevated angle. A slanted board is especially useful for individuals in wheelchairs who may not have the neck mobility of their peers. Furthermore, individuals with fine motor disabilities may utilize adapted cutting tools such as looped scissors. This helps the student focus on cutting rather than holding and gripping the scissor properly.

Assistive Technology Usage with Other Health Impairments

Assistive technology can be used in many ways for individuals with other health impairments. For this section, I focused on allergies and seizures. As a result, I will focus the assistive technology devices on those impairments.

Individuals with allergies each have different responses when confronted with an allergen. As a result, allergy applications can instruct the person what foods to avoid. Some applications even include scanners in which the product can be scanned. The individual will then be able to decide whether he or she can consume the food item. Some applications compatible with Androids and iPhones include: Find me Gluten Free, AllergyEats, AllergyManager, Around Me, and Med Helper.

Individuals with seizures may have more than one seizure a day or have seizures less frequently. One of the most important parts of seizure management is timing each seizure. This allows medical professionals to find abnormalities within the seizure patterns (Epilepsy Society, 2015). As a result, timers are essential assistive technology devices to individuals with seizures. It allows an observer to record the duration either using a standard timer or a timer on their cellphone or tablet device. Some cellphone or tablet applications also include: first aid instructions for individuals with the person having a seizure, a seizure diary, and medication list for medical professionals (Epilepsy Society, 2015). The Epilepsy Society provides a free application, which can be downloaded to any mobile device.

Conclusion

Assistive technology benefits a variety of individuals with disabilities. Assistive technology helps close the gap between disabilities and abilities by accommodating and

modifying situations and materials for individuals. As a result, the students with special needs can be placed in a least restrictive environment, experiencing the same learning environments as their typically developing peers. The technology utilized by a teacher does not have to be costly as there are plenty of options that will not cost the school or family much money. Additionally, the technology should be provided for the purpose of accommodate of modifying the curriculum or environment.

With technology evolving, the use of assistive devices in special education will also evolve. As a result, devices will change year to year; therefore, it is vital for professionals to not only stay up-to-date on new technology, but also on where to find accessible technology for all students.

Students with disabilities will be accommodated more than ever before, as there will be more solutions and ways to help the individual. Assistive technology is a way for students with disabilities to obtain similar goals or even the same goals as their peers while being in a general education classroom. As a result, general education teachers and special education teachers need to welcome assistive technology into the classroom in order to make curriculum more accessible to all students. Research has shown that by giving students assistive technology, they are able to better access their education, closing the gap between special education and general education. This allows students to participate in academic experiences such as being in a period of general education instead of special education (Alnahdi, 2014). Additionally, the use of assistive technology has proven to show that students become more independent than special needs peers without

assistive technology (Scherer & Glueckauf, 2005). As a result, students are more likely to be successful with job skills and independent living after their K-12 education.

In order to determine the student's eligibility for an assistive technology device, the teacher should discuss the implications of the device and disability with the IEP team and student. The team can use assistive technology assessments such as the Wisconsin Assistive Technology Initiative (WATI) or Ohio Center for Autism and Low Incident (OCALI). Both organizations provide free online assessments for determining the best assistive technology device for students. The websites provide tests for the thirteen disability categories covered by the Individuals with Disabilities Education Act. To use either resource, go to either organization's website listed in the appendix and follow the instructions.

The diagnostic assessment will facilitate the team with finding the proper assistive technology for each student, as there is not one universal device for a specific disability. Using a local lending library can test the devices. In order to locate a lending library, find the nearest Board of Developmental Disabilities. The board can provide parents and professionals with resources such as the nearest lending library and transition programs for individuals with disabilities.

A device must grow with the student and be utilized in multiple locations such as in the community and school. The device that a student uses must be dynamic due to the fact that they are costly and often have an acquisition period for the student, family, and professionals. It is also important to remember that parents and professionals must be

trained in using the device. There may be an acquisition period for the student and team members, but ultimately the device should help the student academically, socially, or functionally.

In conclusion, technology has been vital to the advancement of special education. It allows students of all needs to learn in their least restrictive environment and adapt to their surroundings. Additionally assistive technology allows students with disabilities to access their community, become employed, or attend postsecondary schooling by modifying the world to their needs. As technology advances, students will become more ready for their futures to either advance their education, work, or utilize government resources such as adult services and transition agencies.

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Appendix

Assessment Decision for Assistive Technology

WATI- This website provides tools to assess individuals in order to provide the proper assistive technology device. The assessments are free for the public. The website also offers a lending library, in which registered teachers and therapists may check out assistive technology devices to loan for a month to try with students.

<http://www.wati.org/?pageLoad=content/supports/free/index.php>

OCALI- This website also provides tools to assess individuals in order to provide proper assistive technology devices for all disabilities. OCALI is a resource that provides tools to individuals, specifically with autism, in Ohio but is accessible to anybody. The website has teaching modules which are free and a transition center for students who are identified with a disability at the age 16 and above transitioning from school to employment. Assistive technology must transition with students to their future employment. This must be a consideration when selecting devices.

http://www.ocali.org/project/guidelines_for_assistive_technology_assessment

Blogs for Teachers

Assistive Technology Blog- This blog focuses on assistive devices for reading and writing. The majority of the devices are high technology devices.

<http://bdmtech.blogspot.com/>

Ability Tools- This blog gives weekly updates regarding assistive technology in special education. There is also a podcast available regarding assistive technology options in the classroom.

<https://abilitytools.org/blog/>

Glenda's Assistive Technology- This blog features communication devices in the classroom. Glenda explains different low and high technology devices she has used in her classroom to help students of all abilities communicate such as video modeling, PEC's, and audiobooks.

<http://atclassroom.blogspot.com/>

Special Education Strategies and more- This blog discusses positive strategies for teaching academic, emotional, and social growth in a special education setting. Some of the strategies the teacher uses involves technology to stop problematic behaviors.

<http://michellespecialeducation.blogspot.com/>

Tools Mentioned in the Document

AllergyEats- This is an application available on Androids and Apple devices. This application helps individuals see what nearby restaurants are safe to eat at with specific food allergies.

<https://play.google.com/store/apps/details?id=com.allergyeats.allergyeatsmobile&hl=en>

Allergy Manager- This application is available on Apple devices. It allows individuals to see seasonal weather allergy conditions for the day to determine when to take medication and how to manage allergies that are affected by the seasonal changes.

<https://itunes.apple.com/us/app/allergymanager/id392981359?mt=8>

AroundMe- This is an application available on Apple devices. AroundMe allows individuals find locations around them such as gas stations, restaurants, hospitals, and etc. This can be an especially helpful tool when teaching students problem-solving skills.

<https://itunes.apple.com/us/app/aroundme/id290051590?mt=8>

ConnectABILITY- This is a free online tool to create visual supports. These can be used in the classroom, at home, or any environment. Some tools include token boards, schedules, and rules.

<http://connectability.ca/visuals-engine/>

Find Me Gluten Free- This is a website and application for Androids and Apple devices. Find Me Gluten free allows individuals to find places that are gluten-free, look at menus, and look at reviews from nearby gluten-free restaurants.

<http://www.findmeglutenfree.com/>

MedHelper- This application is available on Android and Apple devices. It allows individuals to track their medication intake, take notes regarding their health, and track their vitals.

<http://medhelperapp.com/>

Picture Planner- This is an iPhone, or Ipad application that is available for free. It is a visual schedule that helps individuals stay on track and reminds the person what to do next.

<https://www.cognitopia.com/>

Pogo Boards- This is a website in which educators, students, and families can create picture boards to help individuals communicate. In order to access this website, you need to buy a subscription.

<http://www.pogoboards.com/>

Time Timer- This is a visual clock. An individual can see the minutes count down. In the original model of this clock, one can pick it up and move it from location to location. It is available for purchase on the website. Additionally, there are new models available such as a watch version.

<http://www.timetimer.com/>

Time Tracker- The time tracker is a visual clock for students to understand when it is time to leave an activity. The clock is set-up like a stoplight. Before an activity ends, students are warned with a yellow light. Once the time is up, the red light flashes. The time tracker is available for purchase on this website along with other learning tools.

<https://www.learningresources.com/product/time+tracker--174-+visual+timer+-amp-+clock.do>

Catalogs of Assistive Technology for Purchase

Able Net- This catalog provides assistive technology for all disabilities categories inside the classroom and at home, such as making toys more accessible. The company provides curriculum for K-12, as well as extended school year programs.

<https://www.ablenetinc.com/>

Autism Speaks- This resource provides a list of websites with tools that can be used for students with Autism Spectrum Disorder.

<https://www.autismspeaks.org/family-services/resource-library/assistive-technology>

Different Roads- The catalog is designed for students with Autism Spectrum Disorder with tools like visuals, timers, and token boards, but products can be used for students in special education or general education.

<http://www.difflearn.com/>

Enable Mart- This website provides tools, supplies and curriculum for a range of all disabilities categories listed in this thesis.

<https://www.enablemart.com/>

LSS Products- This catalog provides tools for individuals with vision and hearing disabilities.

<http://www.lssproducts.com/>

Mass Match- This tool provides assistive technology for all disability categories and lends the devices to individuals in Massachusetts, especially expensive devices. There are similar governmental programs in most states.

http://www.massmatch.org/find_at/at_catalogs.php

School Specialty- This website includes teaching supplies for indoor and outdoor learning which are accessible for all students. The focus of the website is creating a learning environment that makes education obtainable for any student.

https://store.schoolspecialty.com/OA_HTML/xxssi_ibeCategoryPage.jsp?docName=V700839&minisite=10206

Spectronics- This website provides ACC (communication devices) devices for all abilities, which are not limited to high technology devices.

<https://www.spectronics.com.au/catalogue/communication-tools>

Guides for Parents and Professionals

CEC Standards- These are standards in which professionals in special education must uphold when teaching or providing care for individuals with disabilities. CEC provides up-to-date policies regarding special education law and advocacy. Additionally, the website provides professional development such as webinars and professional training.

<https://www.cec.sped.org/Standards>

Wrights Law- This website provides information for parents, advocates, and educators regarding changes to the law and resources. This resource is open to the public and contains articles regarding policy on finding assistive technology devices, early intervention, monitoring progress, and much more.

<http://www.wrightslaw.com/info/atech.index.htm>