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AT OPTIONS WITH CHILDREN WITH AUTISM

by

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A Scholarly Project

Submitted to the Occupational Therapy Department

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

Master's of Occupational Therapy

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This Scholarly Project Paper, submitted by Melissa Stevens and Megan Neppl in partial fulfillment of the requirement for the Degree of Master's of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

_____
Faculty Advisor

_____
Date

PERMISSION

Title: AT Options for Children with Autism

Department: Occupational Therapy

Degree: Master's of Occupational Therapy

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ABSTRACT

According to information from the Center for Disease Control Prevention (2007)
it is estimated that autism affects 1 in 150 births. The Autism Society of America (2007)
reports that the prevalence of autism is expected to increase by 10-17 % per year. It has
been shown through research that assistive technology can benefit or increase
performance in children with autism spectrum disorder. It also can address performance
areas limited in children with autism, such as communication, cognition, self-care,
leisure, social/play, productivity, and sensorimotor (Reed, 2002). Assistive technology
can aid these children in various contexts such as school, home, and play. There is a lack
of knowledge among entry-level professionals and educators in regards to implementing
assistive technology devices ((Bryant, Erin, Lock, Allan, & Resta, 1998; Long & Perry,
2006; Long, Woolverton, Perry, & Thomas, 2007)

A literature review was conducted in order to obtain an overview of autism,
assistive technology used for children with autism, and what the need is for training in
assistive technology. An inservice was developed based on the findings from the
literature review. The inservice is intended to provide an overview of autism, assistive
technology and the specific assistive devices used for children with autism.

This inservice is designed for entry-level occupational therapists, physical
therapists and educators who are working with children with autism. It is intended to be
three hours in duration, and be presented by an occupational therapist who has knowledge

about autism and assistive technology. All materials needed for the instructor as well as the participants are included in the product.

CHAPTER I

INTRODUCTION

Statement of the Problem

According to Woodgate, Ateah, and Secco (2008) "autism is a complex

developmental disorder characterized by a triad of impairments in reciprocal social

interaction; communication; and restricted, repetitive, and stereotypic patterns of

behaviors, interests, and activities" (p.1075). Children with autism have varying

difficulties in performing activities during their daily lives. This often leads to

impairments in a variety of areas, which can include activities of daily living, social

context, and school environment. Research reviewed in Chapter II has shown that

assistive technology devices can be utilized with children with autism in order to

compensate for loss of function. However, there is a lack of knowledge among entry-

level professionals and educators in regards to what specific assistive technology devices

children with autism could benefit from.

The focus of this project is to explore the assistive technology devices that are

available for children with autism. It is important for entry-level professionals as well as

educators to be aware of the devices which can be utilized for these children. Throughout

the authors' research, a need for training among these professionals and educators was

found (Bryant, Erin, Lock, Allan, & Resta, 1998; Long & Perry, 2006; and Long,

Woolverton, Perry, & Thomas, 2007). As stated by Bryant, Erin, Lock, Allan and Resta

(1998), "A current trend in the fields of special education, rehabilitation, and technology

is to train individuals with disabilities in the use of assistive technology (AT) devices and services to compensate for their disabilities and/or utilize their functional abilities to meet environmental demands"(p. 55).

The product of this scholarly project is an educational inservice for entry-level occupational therapists, physical therapists, and educators. This inservice will provide the participants with knowledge on autism spectrum disorder, assistive technology, and assistive devices used with children with autism. The participants will be provided with assistive technology resources and will have the opportunity to engage in hands-on activities, which include a choice board and a communication board. The inservice is designed to be presented by occupational therapists who have knowledge about autism and assistive technology.

The occupational model used to develop the inservice for entry-level professionals and educators working with children with autism was Occupational Adaptation. This model was chosen due to its assumption that adaptation leads to increased occupational performance. This model also takes into the consideration that the client is in control of the occupational intervention. The product developed focuses on assistive technology devices used with children with autism in order to improve their performance. It also strives to let the children with autism have some control over what types of activities they would like to participate in. Occupational adaptation was also used to address the audience attending the inservice. Occupational adaptation focuses on using experiences a person has had or knowledge they have learned in order to adapt an activity to increase occupational adaptation. This model also focuses on occupational readiness, which "consists of interventions that are designed to address deficits in the

Person systems (sensorimotor, cognitive, or psychosocial) that are interfering with performance in the selected occupational role" (Schkade & Schultz, 2003, p.214). This inservice addresses occupational readiness by giving the participants the foundation of knowledge in order to adapt their role in providing interventions to children with autism.

The rehabilitation frame of reference was also utilized in this project. This frame of reference strives to enable an individual with a disability or illness to be able to achieve maximum function in performing activities during their daily lives. The rehabilitation frame of reference applies to our project because it focuses on applying compensatory methods, providing assistive devices, and the ability to adapt the environment (Seidel, 2003).

<center>Importance to the Profession</center>

The HAAT Model was utilized in the creation of the product in order to incorporate a holistic approach. This model focuses on the human, activity, assistive technology device, and the context which activities are being performed in. This is similar to the holistic approach which occupational therapists use in order to implement treatment (Cook & Polgar, 2008)

Through the research, the authors found support for occupational therapists to work with children with autism and with the provision of assistive devices. Occupational therapists are part of a multidisciplinary team of professionals and/or educators who, together, will provide assistive technology services to consumers and their families and caregivers. Other members of this team may include physical therapists, vendors or representatives from assistive technology equipment companies, seating and positioning specialists, orthotist, and educators.

Summary

Chapter II of this document is a literature review, which is divided into several different sections which include an overview of autism and assistive technology. Chapter III contains information on how the product correlates with the findings from the literature review. Also included in this chapter is the methodology that was used in order to develop the product. Chapter IV contains the complete inservice designed for this scholarly project. Finally, Chapter V includes a summary of the project, a proposal of how it can be implemented, limitations, and recommendations.

CHAPTER II

LITERATURE REVIEW

It has been shown through research that assistive technology can benefit or increase performance in children with autism spectrum disorder. Assistive technology can aid these children in various contexts such as school, home, and play. It is important for individuals working with children with autism to understand the different types of devices as well as the benefits. Research has supported that there is a need for training with assistive technology devices for professionals and educators working with children with autism. Occupational therapists have the knowledge and background that focuses on how using adaptive devices can enhance the quality of life and promote increased function. A review of literature was completed in order to explore the areas of usage for assistive technology and the need for training among professionals and educators. The first section contains an overview of autism and some of the areas of difficulty for children with autism. Following this section is information on assistive technology and how it applies to children with autism. The next section includes benefits and drawbacks of using assistive technology devices. After this section, areas of use of assistive technology are noted. These areas include: communication aids, physical impairments, social/play, and visual and auditory aids. Proceeding this section is the need for training among entry-level professionals and educators. The final section provides information on the role of the occupational therapist.

Introduction to Autism

Autism is considered to be a pervasive development disorder (PDD) which is

"characterized by severe and pervasive impairment in several areas of development"

(DSM-IV, 2000, p.69). According to Woodgate, Ateah, and Secco (2008) "autism is a

complex developmental disorder characterized by a triad of impairments in reciprocal

social interaction; communication; and restricted, repetitive, and stereotypic patterns of

behaviors, interests, and activities" (p.1075). According to information from the Center

for Disease Control Prevention (2007) it is estimated that autism affects 1 in 150 births.

The Autism Society of America (2007) reports that the prevalence of autism is expected

to increase by 10-17 % per year. Unfortunately, there is no known cause of autism but it

is believed to be linked to malformation of the brain and neurological system. Autism

affects many different aspects of life, including, self-care, productivity, leisure,

sensorimotor, cognitive, psychosocial, and environment (Reed, 2002). Families of

children with autism experience many different challenges during diagnosis, intervention,

and activities performed in daily life. Frequently, families develop structured routines

and patterns of life in order to maintain consistency; they tend to feel as though they have

become isolated from a normal life due to the constant demands of their child's disorder

(Reed, 2002).

There are a variety of areas in which children with autism may have limitations.

Activities of daily living are often difficult for these children. Children with autism

frequently have a difficult time eating and feeding themselves independently. Children

with autism also may have difficulties managing self-care tasks, such as dressing,

toileting, personal hygiene, sleep and rest, the use of communication devices, and

shopping. Children with autism may also display difficulties in leisure and play skills.

They may struggle with the idea of having play or leisure activities, being active in social

activities, and choosing how they would like to spend their free time (Watling, R.,

Tomchek, S., & La Vesser, P., 2005).

Sensorimotor deficits in children with autism can vary greatly depending on each

child. Children may display self-stimulating behaviors, such as, "hand or finger flapping

or twisting, head banging, or complex whole-body movements such as body spinning,

rocking, and twirling" (Reed, 2002, p. 16). The child may not meet developmental

milestones, and may display a decrease in muscle tone, postural control, gross motor

coordination, and have delays in their reflexes. There may be noted neurological deficits,

such as increased or decreased sensory processing or a malfunction of the nervous system

to be able to handle multisensory input. Children with autism often have poor eye

contact, are unresponsive to others, and have difficulties with motor planning (Reed,

2002).

Cognitive deficits are not uncommon among children with an autistic disorder. A

child with autism may display difficulties transitioning from one activity to the next, due

to the resistance to change. Repetitive behaviors or interests and self-stimulatory

behaviors may also be seen in children with autism. These can range from staring at or

smelling certain objects to hand flapping. It is very common for children with autism to

have self-stimulatory behaviors due to sensor motor deficits (Wisconsin Early Autism

Project, Inc., 2003).

It is common for children with autism to have an impairment in their social

relationships and communication. The child may not seek out external relationships with

others, and may actually use other people in order to get to an object rather than for emotional reasons. The child may not engage in imaginative play, may have little or no eye contact, and may find it difficult to form relationships with peers (Sicile-Kira, 2004). Language development can also be an issue among children with autism. They may not understand what others are saying, and my not be able to speak themselves. It is also very common for children with autism to use echolalia, which is a repetition or echoing of what others are saying (Wisconsin Early Autism Project, Inc., 2003).

Assistive Technology and Autism

According to the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Public Law 100-407), assistive technology is defined as, "any item, piece of equipment, or product system, whether acquired commercially for off the shelf, modified or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (AOTA, 1998, p. 870). Some of the commonly used AT devices include "computers, printers, scanners, CD-ROM players, VCRs, cameras, telecommunications, modems, Intranet, Internet, Word Wide Web, voice mail, pagers, mobile phones, fax machines, and augmentative and alternative communication (AAC) devices" (AOTA, 1998, p. 870). These devices are used in school systems, at work, and in peoples' homes in order to promote independence among children, adolescents, and adults.

Some children with autism have the abilities to use assistive technology, while others may not. The level of difficulty for device use combined with the level of severity of autism will determine whether or not the child will be able to use the device in a functional manner. It is important to utilize an individualized approach when using

assistive technology with children with autism. Another important factor to be aware of is the context in which the child is being trained to use the assistive technology. It has been shown that children with autism are not able to generalize training in assistive technology devices from one setting to another (Sicile-Kira, 2004). As Ganz, Sigafoos, Simpson, and Cook (2008) stated, "Nonverbal individuals with autism spectrum disorders (ASD) often require the use of picture-based, aided augmentative and alternative communication (AAC) systems. Individuals diagnosed with autism who are nonverbal often use picture-based augmentative and alternative communication (ACC) systems to aid in communication. These systems are used frequently, however there has been little research done on the generalization of the devices to a variety of people and contexts" (p. 89). Therefore, it is necessary to train the child throughout the normal contexts in which the device would be used (Steyaert & De la Marche, 2008).

According to Hess, Morrier, Heflin, and Ivey (2008), assistive technology was the number one skill-based intervention used in the school systems. One of the mains goals for using assistive devices with children diagnosed with autism is to increase their ability to communicate. Communication devices, such as written output devices, voice output devices, devices with no written or voice output, and personal amplification devices are used. If the child is having difficulty speaking, but does know what he or she wants, a voice output device may be useful. A synthesized speech system has pre-programmed messages recorded into the device, and the voice can be customized to the child's gender and age. The use of a communication board or book can also be used if a pre-recorded voice is not necessary. This allows a child with autism to point to symbols, such as words or pictures. An electromechanical communication board can also be used. This

type of communication board is switch-activated and is more mechanical than a regular communication board (Hess, Morrier, Heflin, & Ivey, 2008). Hearing aids are available for children with hearing impairments, as are voice amplifiers for children with soft voices. An FM listening device allows a child with autism to block out background noise while input from someone wearing a microphone is transmitted into a device similar to a hearing aid or headset (Stoller, 1998).

<center>Benefits and Drawbacks of Assistive Technology</center>

Assistive technology devices are being utilized by many individuals for a variety of reasons and there are numerous benefits that go along with their usage. Assistive technology devices can be used with individuals to facilitate and support independent functioning skills, self-help skills (control over environment and/or activity), overall understanding and processing of the environment, social skills, expressive communication and language skills, and sensory processing. When children experience challenges within their environment assistive devices can provide them with opportunities to more fully participate in group activities in the classroom (or social environment), improve communication skills, and to be more independent in their daily lives (Mondak, 2000). Through the use of assistive technology devices, opportunities for individuals with significant disabilities can be enhanced. One of the remarkable benefits of using assistive technology devices is the fact that device use can be used as a teaching strategy or learning method for parents, teachers, and caregivers, etc. to use with individuals with cognitive or learning disabilities. This can provide the opportunity for individuals with disabilities to receive the optimum learning experience similar to that of their non-disabled peers in the classroom. One way in which it is used to teach others is

to help individuals learn correct or normal social skills, adequate emotional capabilities, and proper communication skills. Children with disabilities or disorders, such as Autism, have been able to show improvement in those skill areas listed above with the use of AT devices. A computer program, known as "Mind Reading: The Interactive Guide to Emotions" was found to help children with Asperger Syndrome learn the skill of "emotion recognition" (Lacava, Golan, Baron-Cohen, & Myles, 2007).

It is often thought that play is considered to be one of the main ways in which children learn, and fortunately, it is also an occupation that is most often meaningful to them. When a disability or dysfunction gets in the way of the process of play, the learning experience and the meaning derived from the activity are both affected. "The activities that a person chooses to engage in hold purpose and meaning for that individual. When a person is unable to participate in meaningful activities or occupations, assistive technology may be used as a support" (Buning, Hammel, Angelo & Schmeler, 2004, p.678). Assistive technology devices can be thought of as being a form of play for children and can promote the process of their learning experience. Assistive devices, when used correctly, can be a fun and enjoyable experience for children that will be able to incorporate the process of play and learning. According to Hetzroni, Rubin, & Konkol (2002), a computer-based interactive symbol identification system was able to "provide enjoyable visual and auditory stimulation paired with the matching of the symbols" (p.66).

AT devices can also aid individuals by helping them to be more independent, productive and included, socially and physically, when performing activities in their daily lives. According to Stoller (1998), a goal of assistive technology is to "remediate

developmental skill deficits interfering with occupational performance by encouraging

use of higher level skills in any of the component areas: sensory-integrative, motor,

cognitive, psychosocial, or social" (p. 5). In addition, assistive technology can be helpful

because device use can facilitate independence, thus, taking some of the burden of care

off of parents, teachers, and caregivers, etc. AT devices can be "used to promote the dual

objectives of enabling function and improving an individual's skill level" (Cook &

Polgar, 2008, p. 94).   These devices can help individuals to gain more control over their

lives, to participate more in various contexts, and to have more opportunity to interact

with non-disabled individuals.

On the other hand, there are drawbacks that are associated with the use of

assistive technology devices. Using AT devices requires training or education sessions

with clients prior to usage of equipment. Participating in training/education sessions may

feel like a burden to the client because it may take multiple training sessions over a long

period of time. Maintenance or upkeep of equipment (correction of errors) needs to be

done to ensure proper usage and safety of an AT device at all times. There are two types

of errors that may occur: "random errors, "which are "infrequent and generally chance

occurrences, and periodic"; or "regular errors" which "occur under predictable

conditions" (Cook & Polgar, 2008, p. 111). Even though using these aids can increase the

level of independence of a client, if not utilized correctly the client can have a decrease in

function due to the dependence on the equipment. Another drawback of using assistive

technology is the expense that goes into its usage. "Evaluation, implementation, and

maintenance and repair of assistive technologies can be costly, and most consumers do

not have the financial resources available to purchase the necessary services and equipment" (Cook & Polgar, 2008, p. 144).

Areas for Use

Assistive technology devices can be used by individuals in many different areas during their daily lives. Some of the main areas of use for children consist of "aids for daily living, blind and low vision, communication, computers, controls, deaf and hard of hearing, education, recreation/play, therapeutic aids and mobility" (Cook & Polgar, 2008, p. 25). The area of usage of an assistive device is dependent on the client's skills, abilities, weaknesses, wants, and needs. Clients or consumers of these devices can have more than one area in which they need assistance or they may need a single piece to be used in more than one context.

Communication Aids

"Communication is the glue that connects the individual with family, friends, the community, and the world at large" (Stoller, 1998, p. 67). Generally, there are two categories for communication systems: aided and unaided. "Unaided systems include speech, sign language, gestures, vocalizations, and facial expressions. Aided systems involve the use of physical, mechanical or electronic devices" (Stoller, 1998, p. 68). Some examples of communication devices that fall under the category of aided are as follows: *written output devices* (paper and pencil, and computers), *voice output devices* (synthesized speech systems, digitized speech systems, and taped speech systems), *devices with no written or voice output* (communication board or book, eye gaze board or book, simple electromechanical communication board), and *personal amplification devices* (hearing aid, FM listening device, and voice amplifier) (Stoller, 1998).

The use of computers can become a main source for children to communicate with others and to learn or to educate themselves. According to Moore, Cheng, McGrath, and Powell (2005), "many people with autism appear to have a natural affinity for computers and the controlled environment provided by the computer, and they may benefit from individualized tutoring and repetition of exercise" (p. 231). Considering the fact that the main disabling characteristic of children with autism is that they "have impairments in social communication…difficulty with social-emotional reciprocity as well as nonverbal communication such as facial expression, gestures, and eye contact" (Lacava, Golan, Baron-Cohen, & Myles, 2007, p.174) the use of computer programs to teach these skills is very important. Augmentative and alternative communication (AAC) devices can be used by individuals who "have severe speech and language impairments" as well as being "all the means and modes a person uses to communicate" (Cook & Polgar, 2008, p. 371).

Physical Impairments

Frequently, children with Autism Spectrum Disorder (ASD) have impairments in cognition, balance, and sensation. These impairments can be compensated for with the use of a piece of equipment that is used as support or assistance in order to increase function in their daily lives. Therapeutic aids can be used during intervention sessions for children who have sensory impairments, such as during sensory integration therapy session. For example, swings, sliding boards, and/or scooters can be used during intervention to decrease the level of sensory dysfunction. Individuals with Autism frequently have difficulties with hearing and listening. Sensory aids for people who are hearing impaired were created to "help people listen in noise or in the presence of a

competing message, improve distance listening, allow independence, and facilitate group conversation when problems exist because of rapidly changing speakers" (Olson & DeRuyter, 2002. p.199). Occasionally, children with autism have difficulty focusing their attention to task when there are external distractions, such as other noises, going on around them.

It may be beneficial for children with autism to incorporate seating and/or positioning devices in to various activities to reduce the stress received from the environment. A therapy ball can be used to increase engagement or participation in an activity and to improve in-seat behavior (Schilling & Schwartz, 2004). Bean bags, seat cushions, and beaded seat covers can be utilized as well to provide constant sensory input and provide stimulation and decreases inattentive behaviors. Correct seating and/or positioning can provide increased eye contact, effective listening skills, active participation, and stability (Stoller, 1998).

Social/Play

As stated in the previous section, play is not simply just a form of having fun, but also "a process through which children develop their physical, mental, and social skills" (Olson & DeRuyter, 2002. p.451). Children with disabilities can benefit from being able to play at a playground that has incorporated universal design in their equipment because it not only promotes the process of play but also provides the chance to be involved in "normal play" with non-disabled children. Computers and AAC systems can also be considered a form of play for children because most often they have incorporated bright colors, cartoon figures, and fun activities to make learning more interesting to the user. **"**Play is an important part of a child's development and includes a lot of social interaction

components, which can make traditional play for a child with autism a difficult task**"** (Assistive Technology and Autism, 2007). Children with autism tend to learn and play differently than children who have developed in a typical manner, so therefore, it is important to provide them with toys that are meaningful and appropriate. It is also important to encourage play for children with autism as it will incorporate imaginative play as well as appropriate social interactions with other children. (Assistive Technology and Autism, 2007).

Switches can allow children with autism who have decreased cognition or fine motor control to be in control of toys and computers. "Adaptive switches play an important role in helping students who have severe physical limitations participation more fully in the various activities that school offers" (Stoller, 1998, p. 89). There are a variety of methods for activating switches. These methods can include: *physical contact* (buttons, joysticks, switch plates, and levers), *light reception* (infrared light switch), *air pressure* (sip and puff switch, squeeze ball switch, and air cushion switch), and *sound* (voice activated computer programs) (Stoller, 1998).

Visual and Auditory Aids

Assistive technology devices can be used with children with autism to support their strongest processing modality (visual information processing), which can include visual cues and visual schedules. "Because social motivators, such as praise or self-pride, do not function in the same way for children with autism as they do for typically developing children, a high level of external reinforcement is needed initially when teaching skills" (Assistive Technology and Autism, 2007). Schedules and routines can provide organization and consistency for child by using visual prompts, clipboards,

schedule boards, photographs, objects, and videos (Allen, 2002). A strategy that is used quite frequently for children with autism is using what is known as pictorial schedules in order to assist children with autism in being able to better understand sequencing of activities that will in turn make transitioning from one activity to another become easier and less stressful (Assistive Technology and Autism, 2007).   The Picture Exchange Communication System ™ (PECS) is used as a visual support schedule by facilitating communication, through the use of photographs or illustrations. The PECS system does require the assistance of the parent or educator but the child makes a choice using the pictures (Assistive Technology and Autism, 2007). Visual boundaries, such as stop signs, and colored tape, can be used as a visual cue to set limits as a safety precaution or to set restrictions or expectations (Allen, 2002).

In regards to auditory aids, timers can be used to help to set expectations, time limits, and for facilitating going from preferred to non-preferred choices and for helping with transitions. There are a few tips to utilize with children with autism to ease the process of visual/auditory aid use, such as: keep the picture schedule at the child's eye level, use counting for each step in the activity to decrease anxiety, using physical or manual guidance from behind and keep visual prompting to a minimum (Allen, 2002).

<div align="center">Role of OT</div>

The process of obtaining an assistive technology device for a consumer is a long process that takes careful planning and consideration. It is imperative that the consumer's particular needs and wants (including family members, caregivers, etc.) be met in order to eliminate the chances of the device being discarded or not used. Most often, assistive technology devices are offered to clients by a team of professionals

(including occupational therapy, physical therapy, rehab engineers, speech/language pathologists & orthotists) who work together to determine the most appropriate and effective device(s) to utilize. Occupational therapists differ from other professionals in the delivery of assistive technology devices in the fact that they focus their attention on the client's functional abilities during specific tasks in a variety of contexts (home, work, and school) (Cook & Pulgar, 2008).

In order to gain the necessary information from the client to guide this particular process, an evaluation and an occupational profile on the client needs to be developed. During the evaluation the therapist will determine the client's skills, abilities, areas of weakness/concern, needs/wants, and in what context(s) the device will be utilized. An occupational profile is the first step conducted during the evaluation process in order to obtain information about the client regarding "history and experiences, patterns of daily living, interests, values, and interests." This is an opportunity for the client to express their problems and concerns regarding performance in daily life activities (AOTA, 2002). The occupational therapist has a variety of other duties or responsibilities in the provision of assistive devices. "The occupational therapist provides a broad range of services in the application of technology, including evaluation, recommendation, justification of need, advocacy, awareness of funding resources, fabrication, customization, training, integration, and follow-up" (Buning, Hammel, Angelo, Schmeler, & Doster, 2004, p. 678).

In a school setting, the role of an occupational therapist is to aid the client in being able to be more successful in the learning experience and social interactions with peers as well as teachers. According to Isabelle, Bessey, Dragas, Blease, Shepherd, and

Lane (2002) "within the school environment, emphasis is also placed on the occupational therapist's skills in positioning and modifying the physical, cultural, and social context of the classroom in order to give the child the opportunity to benefit from instruction" (p. 35). One of the most important roles the occupational therapist is able to contribute is integrating the AT device in to the child's daily live activities (this includes contexts other than the school environment) for which they are applicable. In regards to play, "the role of the occupational therapist is to structure the environment to optimize play opportunities for the child" (Isabelle, Bessey, Dragas, Blease, Shepherd, and Lane, 2002, pp. 34-35).

"Occupational therapists continue to provide an important service in equipment provision through our understanding of occupational roles and our developed technical and clinical knowledge in this area of practice" (Barbara & Curtin, 2008, p. 59). The focus of an occupational therapist in providing assistive devices to clients is addressing performance areas and performance components as they relate to context. Furthermore, one of the goals of an occupational therapist is to increase the client's independence in their daily participation in activities. This can often be completed with the application of an assistive device that will promote functional independence by decreasing barriers and/or interference(s). The occupational therapist (who specializes in assistive technology) is often thought of as a facilitator of services through their abilities of organizing and coordinating (Shuster, 1992).

<div align="center">Need for Training of Professionals</div>

According to Bryant, Erin, Lock, Allan, & Resta (1998), "A current trend in the fields of special education, rehabilitation, and technology is to train individuals with

disabilities in the use of assistive technology (AT) devices and services to compensate for their disabilities and/or utilize their functional abilities to meet environmental demands" (¶2). As more children with disabilities start using assistive technology in the school setting, it will be necessary to address training needs of educators. The authors stated that "Preservice, general, and special educators should be trained in assistive technology devices, particularly as more and more youngsters with disabilities are placed in general education settings for longer portions of the day" (¶8).

Research has shown that educators, as well as physical and occupational therapists need additional training in assistive technology devices. According to a survey conducted by Long and Perry (2006), 33-59% of physical therapists felt they had inadequate training in each of the five categories: training and access to info regarding assistive technology, confidence level in providing assistive technology or assistive technology services, population of persons with disabilities you serve, and demographic information. The survey displayed that the physical therapists held the highest scores with topics dealing with collaborating with others and working with clients with disabilities and assistive technology and assistive technology services. The participants had confidence in recognizing the need for assistive technology, but lacked confidence in most of the other areas. The most common topics that the participants wanted to learn more about included positioning devices, activities of daily living (ADL's), seating devices, switches, and toy adaptations. The two training methods which the physical therapists reported were more effective than others were person to person instruction and group instruction (Long & Perry, 2006).

Similarly to the physical therapists, some occupational therapists displayed a lack of confidence in training regarding assistive technology use. According to a survey completed by Long, Woolverton, Perry, and Thomas (2007), the two categories in which occupational therapists felt they were the least confident in were identifying sources of funding for assistive technology and assistive technology services and working with high-tech devices. Comparably, the two categories in which the therapists felt they were the most confident in were working with low-tech devices and recognizing that a person with a disability may benefit from assistive technology and assistive technology services. The survey results showed that collaborating with other service providers was ranked as the most adequate training area. Working with clients with disabilities and assistive technology and assistive technology services was ranked as the second most adequate area in which occupational therapists were trained. Next was working with families regarding assistive technology and assistive technology services, followed by service delivery systems regarding assistive technology and assistive technology services, and the least adequate training areas identified were legislation, regulation, and policy related to assistive technology services. Similarly to the physical therapists, the occupational therapists rated the two training methods which were most effective to be person-to person techniques and group instruction.

In an article by Case-Smith (1994), it was shown that entry-level occupational therapists lacked as much knowledge as the advanced occupational therapists who had been working longer. This suggests that entry-level occupational therapists could use some additional training in assistive technology devices, and how to evaluate patients for use of the assistive technology. Case-Smith also noted that occupational therapists could

use extra training in all of the other areas of assistive technology, such as being able to identify equipment to facilitate functional independence, instructing a family how to use assistive technology, assessing a child's self-care and functional needs, and documenting the expected outcomes. Although there is a need for additional training in the occupational therapy profession, a survey was conducted by Kanny and Anson (1998) which provided evidence that entry-level occupational therapy programs are offering more education on assistive technology compared to five years prior to the study. According to the American Occupational Therapy Association, occupational therapists have an important role of knowing general information and being educated about assistive technologies. The idea behind occupational therapists using both basic and complex assistive technology is to help individuals become as independent as they are capable of being. The authors also state that, "professional education prepares practitioners to assess an individual's need for technological assistance" (p. 870). This gives evidence that occupational therapists are trained in assistive technology, and would be very competent resources for other professions who deal with similar cliental, as the authors explain:

> The occupational therapy practitioner collaborates with the client and other professionals, such as speech-language pathologists, physical therapists, rehabilitation technology suppliers, rehabilitation engineers, special educators, and others, to ensure appropriate application of the technological devices. Occupational therapy practitioners are important contributors in creating a successful match between the individual and the assistive technology devices because of their ability to analyze the client's performance skills and capabilities, the characteristics of the assistive technology devices, the requirements of the functional tasks, and the environmental contexts in which devices with be used (p. 870).

Summary

Based on the literature review findings children with autism can be benefit from the use of assistive technology. Literature shows that occupational therapists can play a major role in facilitating the use of assistive technology devices for children with autism. However in order to do so many entry-level occupational therapists, physical therapists and educators would benefit from additional training. The product of this scholarly project is an inservice that focuses on assistive technology options for children with autism. Chapter III of this document describes the methodology used to develop the inservice materials, Chapter IV contains the product in its entirety, and Chapter V includes a summary and recommendations.

CHAPTER III

METHODOLOGY

During the authors' occupational therapy coursework the topics of autism and

assistive technology have been covered. Due to the authors' interest in children with

autism and the use of assistive technology, a review of literature was conducted. The

review of literature was completed in order to determine the areas of life which are

affected in children with autism and the need for training among entry level occupational

therapists, physical therapists, and educators. It was found that the there was a lack of

evidence-based research and literature in the area of using assistive technology devices

with children with autism. Therefore, a more extensive review of literature in the general

areas of autism and assistive technology was completed in order to support this project.

The literature review provided adequate information to guide the development of

the inservice by supplying an overview of information on autism and assistive

technology. The information for the inservice development was supplemented through a

consultation completed with an occupational therapist/assistive technology practitioner

and an assistive technology service provider who were employed at Gillette Childrens

Hospital. The cognitive adult learning theory was also utilized to aid in the development

of the inservice. According to the adult learning theory, hands on activities aid in

learning by allowing participants to understand application, analysis, synthesis, and

evaluation. Group activities also allow participants an opportunity to share experiences

and generalize their learning experiences. This theory also states that experience provides the foundation for learning activities (Kearsley, 2008).

The inservice was developed for entry-level occupational therapists, physical therapists, and educators who worked with children with autism who used assistive technology devices. The inservice was designed to provide the participants with knowledge of assistive technology devices used with children with autism and to allow them to engage in hands-on activities involving low-tech devices. Following the inservice, the participants will have resources and increased knowledge in order to promote and use adequate assistive technology devices with children with autism. Chapter IV contains the inservice developed for this scholarly project in its entirety.

CHAPTER IV

PRODUCT

Assistive Technology Options for Children with Autism is an educational inservice

intended for entry-level occupational therapists, physical therapists, and educators using

adult learning principles, including hands-on learning and visual aids. The inservice is

designed to be presented by occupational therapists who have knowledge about autism

and assistive technology.

The inservice includes general information on autism spectrum disorder, areas of

life affected by the disorder, the need for training in assistive technology among

professionals and educators, and the types of assistive technology used with children with

autism. The inservice includes these topics in power point slides with note pages, pictures

and references of places to find assistive technology devices, and an activity portion

where the participants engage in making a communication and choice board. The first

portion of the inservice provides the participants with the needed background on autism,

using AT with autism, and different AT options. This power point information is used to

provide education on the topic visually and to help the participants to integrate the new

information with their past experiences. The second portion of the inservice allows

participants to be involved in making a few of the actual AT devices. This allows

participants to engage in hands on activities among other professionals and educators,

which allows them to integrate the information they have learned and share past

experiences.

The outcome evaluation provides the presenter of the presentation feedback on the information the participants are educated on as well as feedback on the performance of him or her. The outcome evaluation serves as a tool the presenter can use to adjust the information based on the needs of the audience.

The product is intended as a 3-hour inservice, with the first half focusing on the power point information and the second half focusing on the activity portion. The product includes note pages and references for the presenter's use to assemble any desired additional information. The presenter is also provided with a comprehensive outline as part of the product.

AT Options for Children With Autism

Melissa Stevens, OTS
Megan Neppl, OTS
Advisor: Gail Bass Ph.D., OTR/L
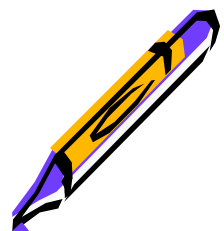
Attention Instructor: The product is intended for entry-level occupational therapists, physical therapists, and educators who are providing assistive technology devices for children with autism. It is recommended that the presenter have prior knowledge of both autism and assistive technology. The following items have been included for the presenter's use: assistive technology resource list, instructions for making low-tech communication devices, and templates needed for the hands-on activity

.

INTRODUCTION

Assistive Technology Options for Children with Autism is an educational inservice intended for entry-level occupational therapists, physical therapists, and educators using adult learning principles, including hands-on learning and visual aids. The inservice is designed to be presented by occupational therapists who have knowledge about autism and assistive technology.

The inservice includes general information on autism spectrum disorder, areas of life affected by the disorder, the need for training in assistive technology among professionals and educators, and the types of assistive technology used with children with autism. The inservice includes these topics in power point slides with note pages, pictures and references of places to find assistive technology devices, and an activity portion where the participants engage in making a communication and choice board. The first portion of the inservice provides the participants with the needed background on autism, using AT with autism, and different AT options. This power point information is used to provide education on the topic visually and to help the participants to integrate the new information with their past experiences. The second portion of the inservice allows participants to be involved in making a few of the actual AT devices. This allows participants to engage in hands on activities among other professionals and educators, which allows them to integrate the information they have learned and share past experiences.

The outcome evaluation provides the presenter of the presentation feedback on the information the participants are educated on as well as feedback on the performance

of him or her. The outcome evaluation serves as a tool the presenter can use to adjust the information based on the needs of the audience.

The product is intended as a 3-hour inservice, with the first half focusing on the power point information and the second half focusing on the activity portion. The product includes note pages and references for the presenter's use to assemble any desired additional information. The presenter is also provided with a comprehensive outline as part of the product.

Outline for AT Options Used with Autism Inservice

Title: Assistive Technology Options Used with Autism

Intended Audience: Entry-level occupational therapists, physical therapists, and educators

Learning Objectives: At the conclusion of the inservice, participants will:

I. Have an increased knowledge level of autism spectrum disorder.

II. Be aware of the aspects of life affected by autism.

III. Will understand the importance of training for the use of assistive technology with autism

IV. Will be aware of assistive technology options and the performance areas they are used in.

V. Will have the ability to access assistive technology resources.

VI. Will gain experience and insight on how to make a communication and choice board.

Agenda:

1. Power point presentation presented in its entirety (Approximately 1 hour and 30 minutes)

2. Activities (Communication board and choice board)

3. Outcome evaluation

Teaching Materials and Strategies:

1. Power point- Used to educate participants on information regarding AT and autism; provide participants with PowerPoint slides to follow along with presentation; provides pictures of AT devices for visual aids; provides participants with a reference list of AT options.

2. Activity- Allows participants to engage in hands on activities among other professionals and educators, which allows them to integrate the information they have learned and share past experiences. The presenter will explain activities and hand out the required materials.

3. Outcome Evaluation- Provides the presenter of the presentation feedback on the information the participants are educated on as well as feedback on the performance of him or her. The outcome evaluation serves as a tool the presenter can use to adjust the information based on the needs of the audience.

Learning Objectives:

At the conclusion of the inservice, participants will demonstrate:

I.   **An increased knowledge level of autism spectrum disorder.**

II.   **Awareness of the aspects of life affected by autism.**

III.   **Understanding of the importance of training for the use of assistive technology with autism**

IV.   **Awareness of assistive technology options and the performance areas they are used in.**

V.   **The ability to access assistive technology resources.**

VI.   **Increased experience and insight on how to make a communication and choice board.**

Resources for Computer Switch Software

These are a few options for computer switch games. It is important to take into consideration the availability of multiple scanning options and auditory cues, as these features are not available in all software.

<u>Don Johnston</u>
donjohnston.com
*Start to Finish books (one switch auto scanning, auditory cues)
<u>Inclusive Technologies</u>
inclusivetlc.com
*Many single and 2-switch games, some with auto and step scanning/auditory cues
*Choose and Tell Stories (one or two switches-errorless learning)
<u>Judy Lynn Software</u>
judylynn.com
*Wheels of Sound (cause and effect, single switch scanning with auditory prompts)
*Switch Accessible Boombox (single switch cause and effect, step scanning)
*Learning Two Switch Step Scanning (progression of games through the process of learning to scan with 2 switches
*Many more games
<u>Laureate Learning Systems</u>
laureatelearning.net
*Creature Chorus (single switch and 2-switch scanning)
<u>Linda Burkhart</u>
lindaburkhart.com
*CD:2 Switches for Success (for use with Intellitools)
<u>Marblesoft</u>
marblesoft.com
*Single Switch Games 2
*Simtech (cause and effect, single, and 2-switch games)
<u>Riverdeep</u>
riverdeep.net
*Kid Pix (drawing program-no switch options, but good for learning mousing with communication devices)

Communication Board

Materials Needed:
- **One paper folder**
- **One sheet of paper with 3 columns including numbers, a blank space, and an "all done" (Can use Boardmaker to construct)**
- **One sheet of paper including any phrases or sayings relevant to child using the communication board (Can use Boardmaker to construct)**
- **One sheet of paper including activities to be used in the schedule. These activities should be in the shapes of squares or rectangles, and should fit in the blank space allotted on the sheet of paper with 3 columns(Can use Boardmaker to construct)**
- **Scissors**
- **Three sheets of laminating paper or a roll of contact paper**
- **One package of circle/square Velcro or a roll of Velcro**

How to do:
- **Take sheet of paper with 3 columns and laminate to left inside portion of folder.**
- **Take sheet of paper with phrases or sayings relevant to the child and laminate it to the right side of the folder**
- **Take the sheet of paper which includes activities to be used in the schedule and cut apart the activities. Next laminate each activity.**
- **Using the sheet of paper with 3 columns, place Velcro loop on the column that is blank and the column that says "all done"**
- **Place Velcro hook on the back of each activity (which is cut out and laminated)**

Costs/person:
- **Paper folder: $1.00**
- **3 sheets of paper: $0.30**
- **Scissors: $1.00**
- **Three sheets of laminating paper: $1.00**
  Contact paper: $0.50
- **Package of Velcro: $3.00**
  Roll of Velcro: $3.00

Choice Board

Materials Needed:

- **Clear picture frame (1 per individual)**
- **One package of circle/square Velcro or a roll of Velcro**
- **Two sheets of laminating paper or a roll of contact paper**
- **One sheet of paper including pictures/symbols with words (8) that are interesting to child**
- **Scissors**

How to do:

- **Place symbol or picture on laminate sheet, and then put another sheet on the other side. Cut out picture. Do all pictures the same way. Set them aside.**
- **Cut strips of Velcro pieces (both sides), one for each picture.**
- **Place one strip of Velcro on picture frame and the other on picture. Place picture on frame.**
- **Place 3 or four pictures on front of frame.**
- **Place extra pictures on back of frame, or keep in storage container.**

Costs/person:

- **Clear picture frame: $3.00**
- **Sheet of paper: $0.10**
- **Scissors: $1.00**
- **Three sheets of laminating paper: $1.00**
  Contact paper: $0.50
- **Package of Velcro: $3.00**
  Roll of Velcro: $3.00

Assistive Technology Options for Children with Autism

1. What new information did you learn from the inservice that you had not received in you educational background?

2. What was the most beneficial part of the inservice?

3. Do you feel you can incorporate the suggested AT devices into your practice?

4. What additional areas would you have liked more information on?

5. Suggestions or additional comments

Pre-Test

1. Briefly give an overview of what autism spectrum disorder is including the impairments or difficulties do these individuals have.

2. Is there a need for training among persons working with children with autism? If so, what is that need?

3. What assistive technology devices can be used with children with autism? Please include the areas of usage as well as the environment.

4. What techniques or strategies do you currently utilize when working with children with autism?

Post-Test

1. Briefly give an overview of what autism spectrum disorder is including the impairments or difficulties do these individuals have.

2. Is there a need for training among persons working with children with autism? If so, what is that need?

3. What assistive technology devices can be used with children with autism? Please include the areas of usage as well as the environment.

4. What techniques or strategies do you currently utilize when working with children with autism?

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CHAPTER V

SUMMARY

This scholarly project was designed because of the authors' interest in autism

spectrum disorder and assistive technology. Prior to the development of the product in

Chapter IV, a review of literature was completed; based on this review it was found that

there is a variety of functional limitations among children with autism. The authors also

found that there are a need for training among entry-level professionals and educators in

the implementation of assistive technology devices.

The first limitation of this project is that this particular inservice has not yet been

presented and the outcomes are unknown. Another limitation is the fact that autism

spectrum is highly complex and not fully understood. There is also a lack of evidence

based research on the topic of autism and the use of assistive technology interventions.

This project specifically focuses on children with autism and should not be generalized to

other groups.

The product is a three hour inservice intended for entry-level professionals and

educators working with children with autism. The first hour and a half is an information

session where the participants will learn about autism in general, the difficulties these

individuals experience and the assistive devices they can utilize. The second hour and a

half is a hands-on activity where the participants will make a choice board and a

communication board. The inservice includes an outline for the presenter to use as a

guideline along with a power point presentation which includes the notes pages to provide additional information. Also included are the instruction and materials lists for completing both of the hands-on projects. A list of resources is also included to for the participants. After the inservice is completed there are course evaluations for the participants to complete. A pre and post test is also available for participants in order to evaluate their knowledge on the topics covered before and after the presentation. The inservice is designed to be presented by an occupational therapist who has knowledge about autism and assistive technology.

It is recommended that a pre and post test be done. The pre-test would seek to measure what knowledge the participants had prior to the in-service, and it is designed to be handed out to the participants upon registration or check-in for the in-service. The post-test would be handed out at the end of the in-service. The post-test would be used to measure what knowledge the participants gained from attending the in-service.

Given that assistive technology is constantly being updated and changed, it is recommended that any adjustments or updates that arise in regards to assistive technology devices or equipment be made on an as needed basis. Technology is constantly changing and improving, and it is imperative that this in-service reflect any new and/or improved devices and equipment that is available for consumers. It is also recommended that changes or updates be made to the information about autism. It is important to include any new techniques or strategies that an individual (professional, educator, or parent) could use with children with autism.

Our final recommendation is that more evidence-based research be done in regards to children with autism utilizing assistive technology devices. Unfortunately,

there is currently little evidence that supports assistive technology devices being used by

children with autism. It would be beneficial to have an adequate amount of evidence

based research that incorporates the use of specific assistive technology devices into the

world of individuals who have autism in order to better support the interventions that

include assistive technology use with this population of children.

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