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IT 103, section 107

February 29, 2012

Assistive Technology

Augmentative and Alternative Communication

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According to The Center for AAC and Autism's website, one out of every 110 children will be diagnosed with autism this year, and of them, up to 60% will be unable to communicate verbally (AAC and Autism, 2009). This paper will focus on Assistive Technology and Augmentative and Alternative Communication for children with disabilities by offering a few suggestions for options for children who need assistance with communication.

Assistive Technology

A great definition of Assistive Technology is that it is "technology used by individuals with disabilities in order to perform functions that might otherwise be difficult or impossible" (AccessIt, 2012). It can include mobility devices as well as hardware and software. Children that cannot verbally communicate need help to do so. Assistive technology can help these children have a voice. The technology necessary to allow them to communicate can be found in high-tech Augmentative and Alternative Communication (AAC) devices.

Augmentative and Alternative Communication

The American Speech and Language-Hearing Association states that AAC includes all forms of communication, other than oral speech, that are used to express thoughts, needs, wants and ideas. Everyone uses AAC when they use body language, facial expressions, and gestures, or with pictures, symbols or when writing. It includes symbols, aids, strategies, and techniques to improve communication (ASHA, 1997). AAC tools are to augment incoherent speech and to provide an alternative when speech and language development is incomprehensible. As a part of normal development, children learn to communicate. When a child cannot verbally communicate, it can cause frustration, and can lead to behavior issues (AAC and Autism, 2009). AAC provides children with disabilities with the means to communicate and therefore, express themselves. It supplements existing speech or sometimes is the only means of speech. The tools

used to for AAC are assistive technology tools. These tools increase social emotional development and language development in children and include anything that assists communication, such as American Sign Language (ASL), a picture exchange communication system (PECS), and low and high technology speech output devices, including Apple's IPad (ASHA, 1997).

There are many types of AAC tools. A low-tech tool is simply a tool that does not need batteries. Users may use a simple head nod or eye gaze to communicate. These tools can be as straight forward as a picture, and include ASL or Picture Exchange Communication System (PECS). According to an article in the *Journal of Applied Behavior Analysis*, PECS is a pictorial system developed for children with communication needs. The pictures are adhered with Velcro on either a notebook or their PECS board (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002). The goal is for the child to not only identify the pictures, but also eventually make sentences. At the start, they will make "I want" sentences by choosing a picture of the snack item they want for snack, water or milk for example. A child uses this system to initiate requests, respond to questions, and make social comments (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002, p. 214). Children learn to scan with PECS, once they understood this technology, they move onto more high technology tools.

A high-tech tool is a tool that needs batteries. These tools include voice output devices that produce sound when activated. These devices offer a nonverbal child an opportunity to voice their needs (Why use a voice output communication device?, 2009). They can be activated directly (direct selection/manual selection) by touching the device or indirectly (alternative activation) using another type of switch (ASHA, 1997). The Center for AAC & Autism website states that an advantage to voice output devices is that they allow the child to "talk." This in turn

allows the communication partner to understand what the child wants or intends. The output also allows the child to know immediately if what the voice output device said is what they meant to communicate providing immediate clarity in their communication (Why use a voice output communication device?, 2009). These systems allow a child to begin to advocate verbally for himself by allowing them to ask for what they want or need.

AAC Tools

This lower high-tech static display device pictured is the Ablenet Super Talker Progressive Communicator (Ablenet SuperTalker Progressive Communicator, 2010) .

For each picture, the teacher or caregiver records the name of the picture, so when the child selects it they can hear the name. Say they choose a picture of a cat. The recording could say *cat*, or say *meow* if the lesson for that display is sounds animals say rather than what is the name of the animal. The pictures are manually changed. Another option with the static display is how many pictures are available. The topic board or overlay can be changed to give more or less options. The static display offers the user the option of combining words to create a message (ASHA, 1997).

This electronic device, displaying pictures for vocabulary that are electronically changed, is a

dynamic display. Pictured is DynaVox V+™ (DynaVox V+,

2011). Others have more frames or less, but each frame represents a picture and a sound when activated. The dynamic display system offers the user access to many layers of vocabulary and the option to create new messages quickly (DynaVox V+, 2011).

The introduction of tablet computers has changed the face of teaching communication strategies to children with disabilities. The previously mentioned tools have many applications but they are finite. With the ability to access the many voice output applications available, the possibilities are endless. These tablets make conversation portable, especially for older students. The iPad and tablet computers appeal to children because they blend in more with their friends, which can increase motivation to use the device as a means to communicate. Research has also shown that the touch screen capabilities simplify access to the devices for children (Light & & Drager, 2007).

The CBS News show, 60 Minutes, recently did a story on the iPad, and its uses in the Autism community. They reported that people with Autism, adults and children, are making breakthroughs in communication with tablet computers and the software applications available. They highlighted a 10-year-old, Juno, who before the iPad, did not communicate. His teachers thought he had the IQ of a two-year-old. After introducing him to the IPad, they found that he was very intelligent. They had used the previously listed tools, but could not access his vocabulary until they used the iPad. It was 'hit and miss' at first, but his teachers found that he has a great fondness for classical music, so they reward him with free time with the iPad to listen to it after he completes his lessons. One teacher noted that because the device is constant, the voice is constant and the pacing is constant, it is easier for autistic children to use this technology. People are not constant; everything about them is ever changing (CBS News, 2011).

The iPad and tablet technology is changing the way some children with disabilities learn to communicate. The cost for an iPad begins at $499.00. The autism software applications are relatively inexpensive, and some are even free. A free, featured application is *Autism Apps,* which lists hundreds of applications for use by children with autism spectrum disorders (Apple Store, 2012). The iPad is much less cost prohibitive than the DynaVox V+ which is over $7,000, it is usually purchased by a school system for use only at the school (DynaVox V+, 2011). A child with disabilities uses a tablet or iPad at home and at school giving them continuity in their communication systems.

Conclusion

Some Augmentative and Alternative Communication devices are Assistive Technology tools. They range from simple static-display voice-output devices to tablet technology with its many software applications. These technologies are necessary for use by children with disabilities to improve their language development, and communication opportunities. iPad software applications provide consistent auditory output, giving the child a chance to learn even without a communication partner. A child begins the scanning process with a PECS, moves up to a static-display voice-output device or a dynamic-display voice output device, or can use tablet technology with which to learn to communicate.

Resources:

AAC and Autism. (2009). Retrieved February 22, 2012, from The Center for AAC and Autism: http://www.aacandautism.com/why-aac

Annotation: This website is a valuable tool for parents and educators who work with children who have difficulty communicating. This website is informative, and easily navigated.

Ablenet SuperTalker Progressive Communicator. (2010). Retrieved February 27, 2012, from MedicalEShop: http://www.medicaleshop.com/ablenet-supertalker-progressive-communicator.html

Annotation: This website provided a picture of a static display device.

AccessIt. (2012). Retrieved February 22, 2012, from What is assistive technology?: http://www.washington.edu/accessit/articles?109

Annotation: AccessIT is the National Center for Accessible Information Technology in Education, and is funded by the National Institute on Disability and Rehabilation Research. Through grants they do research to give people with disabilities more access to information technology.

ASHA. (1997). *American Speech-Language-Hearing Association*. Retrieved February 22, 2012, from Augmentative and Alternative Communication (AAC): http://www.asha.org/public/speech/disorders/AAC

Annotation: This website provided a wealth of information about AAC. It also suggested other sites and organizations with information on AAC.

Apple Store. (2012). Retrieved February 27, 2012, from Apple: http://store.apple.com/us

Annotation: This is a commercial website with information about the iPad and software applications.

CBS News. (2011, October 23). (K. Sughrue, Producer) Retrieved February 22, 2012, from 60 Minutes Apps for Autism: Communicating on the iPad: http://www.cbsnews.com/8301-18560_162-20124225/apps-for-autism-communicating-on-the-ipad/

Annotation: I saw this when it originally aired on televison in October. Preschool special education teachers and students went crazy after it aired. Many discussions about the pros and cons of tablet use with children with disabilities ensued. The article discusses adults and children with autism and how they use the iPad to communicate more easily.

Charlop-Christy, M., Carpenter, M., Le, L., LeBlanc, L., & Kellet, K. (2002). USING THE PICTURE EXCHANGE COMMUNICATION. *Journal of Applied Behavior Analysis , 35* (3), 213-231. Retrieved February 22, 2012, from EBSCOHOST: http://web.ebscohost.com.mutex.gmu.edu/ehost/pdfviewer/pdfviewer?sid=888aa972-c759-4c06-a5c3-8b171f602d84%40sessionmgr14&vid=4&hid=15

Annotation: This article provides a great explanation of PECS and their use. Once a child is able to use a PECS, they may move onto using a voice output device.

DynaVox V+. (2011). Retrieved February 2012, from DynaVox: http://www.dynavoxtech.com/products/vplus/

Annotation: This webwite provided a picture for a dynamic display voice output device.

Light, J., & & Drager, K. (2007). AAC Technologies for Young Children with Complex Communication Needs: State of the Science and Future Research Directions. *AAC: Augmentative & Alternative Communication , 23* (3), 204-216. Retrieved February 22, 2012 from EBSCOHOST: http://web.ebscohost.com.mutex.gmu.edu/ehost/pdfviewer/pdfviewer?sid=888aa972-c759-4c06-a5c3-8b171f602d84%40sessionmgr14&vid=9&hid=15

Annotation: These authors look into the exiting AAC technologies, and what future research should include to improve children with disabilities opportunities to communicate. It discusses tablet use, along with Apple's iTouch and iPad.

Why use a voice output communication device?. (2009). Retrieved February 22, 2012, from: The Center for AAC & Autism: http://www.aacandautism.com/why-aac/why-use-aac

Annotation: This website, also from AAC & Autism provides valuable information about voice output devices, and their necessity. Parents and educators use this website to learn about new technologies.