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Autism E-News

Volume 1, Issue 3
April 2004

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Autism and Assistive Technology

By Linda Oggel, M.A., CCC-SLP and Sue Palko, M.Ed., VCU T/TAC

What is Assistive Technology?

Assistive Technology (affectionately known as AT) is “any item, piece of equipment or product system, whether acquired commercially, off the shelf, modified or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities.” (IDEA, 1997) This includes a range of devices from light tech to high tech and also includes software. An AT service is “any service that directly assists an individual with a disability in the selection, acquisition or use of an AT device.” (IDEA, 1997) AT is everywhere! Can you think of some AT you use at home, school, work or play? For example, we use day planners, large grip pens,

PDAs (personal digital assistants), eye glasses, TV remote controls, soft grip kitchen cooking utensils, and anti-skid mats under rugs. For people with disabilities, including those with autism, AT not only makes tasks and activities easier, but AT makes them possible.

As the number of public school students with autism spectrum disorders (ASD) increases--a 339% increase from 1992 to 2002 for VA, according to USDOE statistics--(Schafer Autism Report, retrieved 2/18/03. http://topica.email-publisher.com/) so does the number of educators looking for ways to help them. One way to help is through the use of assistive technology. "Why assistive technology," you ask? Because through the use of AT we are able to help give a student access to the general education curriculum by improving and/or increasing the following:

- Communication
- Social skills
- Attention
- Organization
- Academics
- Independent daily living skills

(adapted from Susan Stokes, 2000)

AT Abounds!

Communication

As you read in the Autism E-news volume 1, the vast majority of people with autism are visual learners. Therefore, we need to use visual supports (objects, pictures, line drawings or written words) to improve "receptive and expressive language and decrease the likelihood of a person exhibiting behaviors as a means of communicating." (Leslie Daniel, Autism E-News, vol. 1 (1). In addition the second E-Newsletter concentrated on communication and it contains excellent information (K. Berlin and V. Spencer. Autism E-News, vol. 1 (2). When looking at some AT for communication one should check out the following sites for helpful information:

Visual schedules
http://www.dotolearn.com
http://www.portacom.bc.ca/
http://www.usevisualstrategies.com
http://card.ufl.edu/visual.html

Object and Picture Exchange Communication Systems
http://www.pecs.com

Voice Output Communication Aids (VOCAs):

- CheapTalk 4 http://www.enablingdevices.com, a 4 button device with 5 seconds of recording time for each button
- Voice in a Box

http://www.neatinfo.net/equipment/voiceinabox.html, a multi-message device with 16, 24 or 40 message buttons

- Go Talk http://www.mayer-johnson.com, a light weight device with 9 messages and 4 levels and 6 minutes of total memory
- Talk Pad http://www.frame-tech.com/ , a 4 message device that allows for 15 seconds of recording time
- Tech/Speak http://www.amdi.net, a 12 level device with 32 messages per level

Social skills:

Students with autism by definition have difficulty with social skills. Some AT that can assist students with autism to understand the nuances of social relationships include:

- Navigating the Social World http://www.jeaniemcafee.com contains resources for working with students with high functioning autism or Asperger Syndrome
- Social Stories™ and Comic Strip Conversations http://www.thegraycenter.org, a source for the process which results in a product (Social Story) to help students with autism
- Gaining Face http://ccoder.com/GainingFace/ ,a software program to help people recognize the meaning of others' facial expressions

Attention:

Attention can be an issue for many students, including students with autism spectrum disorders. Some AT ideas that can be used to help maintain a student's attention to tasks are:

- Time Timer http://www.timetimer.com, a visual timer and timer software
- Forewarning boards http://www.cesa7.k12.wi.us to let a student know that an activity is about to end
- Visual schedules http://www.dotolearn.com or http://card.ufl.edu/visual.html or http://www.portacom.bc.ca or http://www.usevisualstrategies.com to let the student know what is next and to allay confusion
- Behavior cue cards (e.g., stop, wait) http://www.mayer-johnson.com or http://www.usevisualstrategies.com to give non-verbal cues
- Overhead projector to use with or without verbal information

Organization:

Students with autism often have difficulty with planning and organizing (known as executive functioning). Some AT to help in this area includes:

- Day planners (from office supply stores)
- Highlighter tape (from office supply stores) for color coded cues
- Post-it notes for giving a written or hand-drawn picture
- Visual schedules http://www.dotolearn.com or http://www.portacom.bc.ca/ or http://card.ufl.edu/visual.html or www.usevisualstrategies.com
- "To do" lists
- Inspiration http://www.inspiration.com software designed for use by students in grades 6 to adults to assist with brainstorming ideas, organization, outlining and much more.
- Kidspiration http://www.inspiration.com the younger version of Inspiration and a good resource for graphic organizers
- PDA (Personal Digital Assistant) http://www.dell4me.com or http://store.palmone.com or http://www.handspring.com used to help with scheduling and organization

Academics:

As we discussed earlier, many individuals with autism learn best when information is presented in a visual format. Teachers can make academic material more visual through the use of the following:

For Reading use:

- a small "window" cut from an index card to restrict the view of a sentence to a few words at a time a ruler or index card for tracking
- highlighters or a colored background to make words stand out graphic organizers to help with comprehension http://www.eduplace.com/graphicorganizer or http://www.inspiration.com or http://www.graphic.org
- single word scanners such as a reading pen http://www.wizcomtech.com
- talking word processors such as eReader http://www.cast.org/ereader or IntelliTalk 3 http://www.intellitools.com or Type and Talk http://www.texthelp.com or Write:OutLoud http://www.donjohnston.com, software programs that read text out loud
  electronic books http://www.kurzweiledu.com/ or http://www.cast.org or Living Books® http://www.classsource.com/livingbooks/index.html
- word prediction programs such as Co:Writer® 4000 http://www.donjohnston.com or Read and Write http://www.texthelp.com, software programs that reduce the number of keystrokes needed to encode a word

For Math use:

- a talking calculator http://www.lifewithease.com/talkcalc.html which speaks numbers after they are entered
- graph paper to assist in keeping numbers aligned
- an abacus as a manipulative
- talking watch http://www.azhearing.com/low_vision/products1/talkingwatches.htm that speaks the time
- Coin-U-Lator http://www.AttainmentCompany.com, a calculating device using visual cues (coin/dollar pictures) for addition and subtraction functions.
- Intellimathics 3, an interactive math software designed by Intellitools for K-5 learners which features virtual manipulatives http://www.intellitools.com

For Writing:

- Picture It http://www.slatersoftware.com which pairs a visual picture or symbol with a typed word
- Writing with Symbols™ 2000 http://www.mayer-johnson.com which pairs a visual picture or symbol with a typed word
- Write:OutLoud® http://www.donjohnston.com which reads aloud the typed words
- AlphaSmart® as well as the Dana http://www.alphasmart.com, small word processors
- Co:Writer® http://www.donjohnston.com which aids in word prediction and spelling
- Intellikeys® http://www.intellitools.com an enlarged keyboard that enables users to easily type, enter numbers, navigate on-screen displays and execute menu commands
- Read and Write http://www.texthelp.com, a software program featuring speech feedback, phonetic spell checking, and word prediction
- Clicker http://www.cricksoft.com/us/, a computer program that enables students to write with whole words, phrases or pictures

Independent Daily Living Skills:

Daily living skills are an essential part of everyone's life. To increase independence for student's with autism you can try:

- Non skid materials to hold things in place (from "dollar" type stores)

- Color coded materials to draw attention to something
- Velcro http://www.fastenation.com or http://www.sammonspreston.com to attach or fasten items; aids with fine motor skills
- A pump toothpaste dispenser
- recipes enhanced with picture-word sequences http://card.ufl.edu/visual.html or Boardmaker™ pictures http://www.mayerjohnson.com
- visual sequencing for dressing, cooking, washing, toileting, etc. http://www.dotolearn.com or http://www.portacom.bc.ca or http://www.usevisualstrategies.com

These are only a few ideas to get you started in using assistive technology to help your students with autism access the general education curriculum.

Universal Design for Learning (UDL)

Being a teacher in today's educational arena can be very challenging. New state and federal standards required some teachers to reevaluate the way in which they present information to their students. Teachers are compelled to cover a large amount of information but also to instill a deep understanding of the material. Because of this shift we are expecting more of our students. We not only want our students to acquire factual knowledge on a subject, but we want them to use the skills they have learned to acquire new knowledge, and to apply what they have learned. In the quest to better serve students and to meet the ever changing demands of federal and state legislation, more and more teachers are using Universal Design for Learning (UDL) which integrates research-based practices such as multi-sensory teaching, performance based assessment, and differentiated instruction.

The concept of Universal Design for Learning (UDL) originated from the architectural concept of Universal Design (UD) developed by Ron Mace at North Carolina State University. The UD architectural concept "is to create structures that are conceived, designed, and constructed to accommodate the widest spectrum of users, including those with disabilities, without the need for subsequent adaptation or specialized design" (Rose and Meyer, 2002, 70). The subsequent concept of UDL was developed by the Center for Applied Special Technology (CAST). It is designed to help educators focus on, "developing curricula that provide students with multiple ways of accessing context, multiple means for expressing what they learn, and multiple pathways for engaging their interests and motivation" (Howard, 2004, 26-27). Universal Design for Learning, like most new concepts, was born out of necessity as well as "several issues and advancements, including legal mandates, new knowledge about brain functioning, increased understanding of the nature of learning, and perhaps most importantly, by advances in, and the widespread availability of, new technologies" (Howard, 2003, 114). UDL is comprised of three overlapping principles with one common focus: "to provide students with a wider variety of options" (Rose and Meyer, 2002, 74).

The three guiding principles are to

1. Provide multiple and flexible methods of presentation.
2. Provide multiple and flexible methods of expression.
3. Provide multiple and flexible options for engagement. (Rose and Meyer, 2002)

Just as architects design buildings with ramps and automatic doors to assure assess to all, we as educators are being challenged to examine our curriculums to build “ramps” and “automatic doors” to help ensure access to each of our students.

To get started with UDL in your classroom you will need to have some working knowledge of the curriculum goals for the students in your class, as well as the technology you have available to you in your school or within your district. The assistive technology team in your district can be an invaluable resource for you. Once you have gathered that information, further examine the curriculum and the lessons you are teaching. Taking into account the learning styles of the students in your class, try to match your presentation style with the students’ learning styles.

The first UDL guiding principle talks about flexible styles of presentation. Some things you can try include pairing visual information with auditory information or doing hands-on activities. Many teachers report that the use of graphic organizers help students focus on pertinent information, while others have commented on the use of active note taking as a means to help students learn and understand new information.

The second principle suggests that we try to incorporate flexible methods of expression into our classrooms. This can be done by allowing some students to dictate test answers and written assignments. Also, you might encourage a student to make pictorial representations, or a clay model, while another student might use a word processor, mnemonic strategies or even a word prediction program to help with the writing process.

The third principle of UDL looks at adding flexible options for engagement, such as how a teacher might incorporate individual student’s interest at a deeper level into the subject material. This might be done by integrating sports into math or by infusing movies into English and writing. By incorporating student interests, we as educators are better ensuring student engagement, motivation and participation.

To learn more about UDL you can visit any of the following websites.

The Access Center
http://ww.K8accesscenter.org

Accessing the General Curriculum: Promoting a Universal Design for Learning
http://www.aypf.org/forumbriefs/2000/fb110300.htm

Center for Applied Special Technology (CAST)
http://www.cast.org

Defining Universal Design for Learning
http://www.cast.org/udl/

UDL Toolkits
http://www.cast.org/teachingeverystudent/toolkits/

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Howard, K.L. (2004). *Universal Design for Learning Meeting the Needs of All Students.* Learning & Leading with Technology, 31(5) 26 – 29.

Rose, D. and Meyer, A. (2002). *Teaching every Student in the Digital Age.* Alexandria, VA: Association for Supervision and Curriculum Development, 69-84

Stokes, S. (2000). *Assistive Technology for Children with Autism,* http://www.cesa7.k12.wi.us/sped/autism/assist/asst10.htm downloaded 4/12/04.

Regions 1 & 8 T/TAC at VCU
Sue Palko palkosm@vcu.edu
Linda Oggellsoggel@vcu.edu

Regions 2 & 3 T/TAC at ODU
Jennifer Mitchell jmitchell@ttac.odu.edu

Region 4 T/TAC at GMU
Karen Berlin kberlin@gmu.edu
Kris Ganley kganley@gmu.edu

Region 5 T/TAC at JMU
Sally Chappel chappes1@jmu.edu
Dianne Koontz Lowman lowmandk@jmu.edu

Regions 6 & 7 T/TAC at VT
Lora Kingma lkingma@vt.edu
Diann Eaton dweaton@vt.edu

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