



Ontario Association for Families of Children with Communication Disorders OAFCCD

Meeting Communication and Learning Challenges with Assistive Technology

Assistive technology (**AT**) - also known as adaptive technology - refers to the broad range of supports available to assist people with various cognitive, physical, sensory, communication, learning, and other challenges that limit their participation and learning opportunities. AT includes any kind of technology that allows children and adults to work around their area of challenge and enhance their functional independence by accomplishing daily tasks such as talking with friends, going to school and work, or participating in recreational activities.

AT can include equipment such as tape-recorders, calculators and computer hardware and software. The cost can range from a few dollars for “low-tech” items to thousands of dollars for “high-tech” equipment. AT does not provide a “cure” for a condition or disability but it can often help users to overcome some challenges, accomplish tasks more independently and enhance their quality of life. AT solutions promote independence, encourage participation and offer tools for success in a variety of tasks. Children with communication, physical or cognitive challenges have unique strengths, needs, talents and interests. AT can help them use their strengths to engage in social interaction, express knowledge and learn information.

AT for Communication and Learning Challenges:

Students with learning disabilities can be strong candidates for AT support. Some of these learning disabilities include developmental speech and language disorders (articulation, expressive language and/or receptive language disorders) as well as academic skills disorders (reading, writing and/or arithmetic disorders).

Students with hearing impairments benefit from accommodations that may include the use of interpreters, preferential seating, and visual cues. Many of these students also use assistive listening devices such as hearing aids and personal FM systems. Increasingly, schools are experimenting with classroom sound amplification systems to accommodate students with hearing impairments and central auditory processing disorders. There are now some sophisticated and expensive speech recognition technologies available, such as *iCommunicator*[™], that translate a teacher’s voice to text and sign language on a computer screen. Some students who are deaf are discovering the benefits of this technology in classroom settings.

Verbal communication can be a very big challenge for children whose speech and language skills are not

developing or for those who have a condition that affects their speech, language or hearing proficiency.

These children can greatly benefit from the power of technology and use augmentative or alternative methods of communication to accompany or replace their words.

Expressive communication includes a variety of modes, such as speech, pointing, gestures and writing. Augmentative/alternative communication systems **AAC** refer to expressive communication methods other than verbal speech and include sign language, gestures, simple alphabet or picture systems, more complex voice output communication aids (**VOCAs**) and high-tech portable and hand-held computers equipped with specialty software that can speak written text.

Children with expressive speech and language delays or difficulties can use AAC products, devices and systems to enable communication. When an AAC system is recommended by a speech-language pathologist or other professional, parents may initially be resistant to have their child try AAC because they assume that using AAC will hinder their child's speech development or that AAC pertains only to expensive devices that must be used at all times. The following are some common myths about AAC, and a brief description of what is currently known about AAC through evidenced-based research:

1. AAC is only used by people who cannot communicate verbally.

AAC can be used by a wide variety of communicators. Everyone augments their verbal communication with gestures, facial expressions and so forth. AAC is useful for children with delayed speech development, and is becoming more commonly used with people who are learning a second language.

2. Using AAC will delay speech and language development.

Studies show that the use of AAC actually improves speech development where possible (Silverman 1995), and it improves language development in all cases.

3. Somebody who has a VOCA should use it all the time.

Voice output communication aids are often vital components of a person's AAC system. Ideally, they should have access to their device all the time but, there are times when this is not practical or necessary. Communication is in its nature multi-modal; for example, there are many people who use VOCAs in most situations, but not at home with their family.

There are a range of VOCA devices that AAC users can use to communicate single or multiple messages. Dynamic display devices and software that use a computer screen with picture symbols are also available. As well, devices that allow sequencing of icons from multi-page overlays or communication boards and text-to-speech software programs are available for more sophisticated AAC users. The following chart contains examples of VOCA devices that fall into the above headings:

TYPE	DEVICE
Single Message Devices	<ul style="list-style-type: none"> ▪ Auditory Cueing Communicator (<i>Enabling Devices</i>) ▪ BIGmack Communication Aid (<i>AbleNet Inc.</i>) ▪ One-Step Communicator (<i>AbleNet Inc.</i>) ▪ Step-by-Step Communicator (<i>AbleNet Inc.</i>)
Multiple Message Devices	<ul style="list-style-type: none"> ▪ GoTalk (<i>Attainment Co. Inc.</i>) ▪ Hip Talk (<i>Enabling Devices</i>) ▪ Partner 4 (<i>Empowering Resources Inc.</i>) ▪ Tech/Talk (<i>Advanced Multimedia Devices Inc.</i>) ▪ Tech/Scan (<i>Advanced Multimedia Devices Inc.</i>) ▪ VoicePal Pro (<i>Adaptation Inc.</i>)
Dynamic Display Devices & Software Devices that use a computer screen with picture symbols. When certain symbols are activated, the display changes, providing a new set of symbols and messages.	<ul style="list-style-type: none"> ▪ Clicker 5 (<i>Crick Software</i>) ▪ Dynamo (<i>DynaVox Systems</i>) ▪ DynaMyte (<i>DynaVox Systems</i>) ▪ DynaVox (<i>DynaVox Systems</i>) ▪ Enkidu Tablet (<i>Enkidu Research</i>) ▪ Speaking Dynamically Pro (<i>Mayer-Johnson Inc.</i>) ▪ SpringBoard (<i>Prentke Romich Company</i>) ▪ Writing with Symbols 2000 (<i>Mayer-Johnson, Inc.</i>)
Icon Sequencing Devices Devices that allow sequencing of icons from multi-page overlays or communication boards - Minspeak is currently the most common icon sequencing system.	<ul style="list-style-type: none"> ▪ Pathfinder (<i>Prentke Romich company</i>) ▪ SpringBoard (<i>Prentke Romich Company</i>) ▪ Vanguard (<i>Prentke Romich Company</i>) ▪ Vangage (<i>Prentke Romich Company</i>)
Text-to-Speech Devices and Software Devices that generate synthesized speech by typing in letters, words and sentences.	DynaWrite (<i>DynaVox Systems</i>) Enkidu Handheld (<i>Enkidu Research</i>) LightWRITER (<i>Zygo</i>) Link (<i>Assistive Technology Inc.</i>)

Considerations:

When considering AT options and discussing how a child participates in his/her world, hearing the perspectives of the child and his/her teachers, parents and siblings, is key. It is also important to review a child's strengths and needs, the ways in which a child communicates, what he/she likes and dislikes, and what kind of strategies and interventions are helpful in interacting with the child. Additional points to consider include how a child's need for AT might change depending on the environment, for example in the classroom, at the playground or a friend's house or in a public place like a mall or library. This type of input will provide clues as to what technology might work and how well a child will respond to it. Even after AT is implemented, discussions of this nature should be ongoing. Acquiring AT does not just happen once in a lifetime. The type of devices a child needs may change depending on his/her age, abilities, physical status, and demands of the school curriculum and features of the immediate environment.

AT in the Classroom

AT helps many students to access information, connect with others and participate in ways that would not otherwise be possible. Making the school curriculum accessible to all students is a priority for educational jurisdictions around the world. One strategy being adopted with increasing success is the implementation of assistive technologies to support students with special needs. Continued advancements in computer technology are driving the successful deployment of AT in Canadian schools and complement the "low-tech" tools and strategies already familiar to many teachers. However, since Canada does not have a federal education strategy, achieving equitable access to AT equipment and

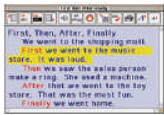


services in all schools across Canada may be a challenge.

The United States has a highly developed educational AT model. Federal laws ensure that special needs students are provided with a “free appropriate public education in the least restrictive environment” and influence educational services across the country. The U.S. Department of Education co-ordinates a national educational strategy and provides all States with funding to support AT initiatives in public schools. Other countries such as the United Kingdom and Australia have similar national laws but these do not include specific language on technology supports for students.

In Canada, the provinces and territories control the delivery of educational services and establish their own systems. In Ontario, the Education Act was amended in 1980 with Bill 82 and all publicly-funded school boards provide a suitable education for all children including special education programs and services for exceptional students. In recent years, the Ontario Ministry of Education has promoted high levels of achievement for all students. Provincial testing was introduced and the curriculum has recently been revised. Expert panel and ministry reports such as “Education for All”– 2005 and “Special Education Transformation”– 2006 have also given boards guidance and direction to better provide the teaching methods, supports, services, programs and a range of placements that promote achievement and learning and that meet the diverse needs of all students. The “Education for All” expert panel noted that assistive technology is a powerful tool which Ontario schools can use more effectively to support a barrier-free learning environment and to give all students equal access to the learning experience and the provincial curriculum in all classroom settings.

The Ministry of Education obtains provincial licenses for educational software and makes these programs available to Ontario public and separate school boards, native education authorities, and university faculties of education. This software is recommended for licensing by the Ontario Software Acquisition Program Advisory Committee ([OSAPAC](#)) and it is distributed by the Ontario Educational Software Service ([OESS](#)) at TVO. Some assistive technology software with text-to-speech capability, speech recognition, word prediction features and visual/graphic supports has been licensed and these programs are available to all schools. Teachers can borrow the software to install on their home computers and use it to plan lessons and prepare classroom resources. Students do not have similar take home rights to prepare their school assignments and complete homework.

AT software programs currently licensed for use in Ontario schools are described below. Access to this software may vary in different school boards throughout the province depending on each board’s computer equipment, network capability, and software policies.

	<p>Write:OutLoud SE is an easy-to-use word processor that gives immediate speech feedback as students’ type letters, words, sentences and/or paragraphs. It provides an auditory and visual cue when words are misspelled and it includes a talking spell checker. Text size/colour and background colour can be changed to improve contrast for students with visual difficulties. Speech pronunciation can also be changed. Write:Outloud has several speech options to match different learning styles and levels.</p>
	<p>Co:Writer SE is a word prediction program that acts like a spelling and grammar-smart coach to help students write better sentences. It can be used with any word processing or e-mail program. As the student types, the software presents options to complete the word or sentence. The flexSpell feature, topic dictionaries and total vocabulary system provide maximum predicting power and writing support for emergent, developing and struggling</p>
	<p>Dragon Naturally Speaking allows students to dictate into a microphone and have the computer convert their speech into text. It requires voice training by reading various reading passages. With teacher support, students develop a voice file to ensure accuracy. Additional training is required as the voice matures.</p>



Clicker 5 is an award-winning, powerful yet easy-to-use writing support and multimedia tool that enables children to write with whole words, phrases or pictures. It can be used to support any area of the curriculum. Children click on words, phrases or pictures in a 'Clicker Grid' at the bottom of the screen, to send them into a talking word processor called 'Clicker Writer' at the top of the screen. They can hear words in the Clicker Grid before they write, or hear what they've already written in Clicker Writer. They can also use full-screen Clicker Grids to create multimedia presentations and talking books. A picture library is included, but children can use their own pictures as well. Children can also record their own voices and use animation or video to illustrate verbs, emotions and phrases.



SMART Ideas Concept-Mapping Software gives students the power to brainstorm, think visually and turn complex ideas into colourful concept maps quickly and easily. Using the proven power of visual learning, it helps students strengthen critical thinking, comprehension and writing skills across the curriculum. Students can use built-in templates or create their own visual maps to represent concepts and relationships that can easily be turned into outlines for writing reports and completing projects.. They can also insert pictures or clip art, record ideas, add levels, link to more information & publish web pages.

For home use, some AT features can be obtained at little or no cost to allow users greater accessibility. For example; AT features that are built into a computer's operating system can be activated, settings in popular word processing software (e.g. Microsoft Word) can be customized, and reading programs such as ReadPlease can be downloaded for free. To learn more about this, visit the following websites: <http://www.apple.com/accessibility>, <http://www.microsoft.com/enable/products>, and <http://www.readplease.com/english/products> .

Reasonably priced AT solutions can also be purchased for home computers. Portable AT programs that come on MP3 players or portable videoplayers are also available and these devices can be used on any computer by plugging them into the computer's USB port. To learn more about this, visit the following website: www.readingmadeeasy.ca .

The field of assistive technology is a dynamic one with many professionals contributing to the collective knowledge about accessible education and AT solutions. To learn more about AT consider exploring the many resources on the internet or joining online communities devoted to the dissemination of AT knowledge. The following resources will provide a good starting point.

Ontario Ministry of Education Licensed Software

<http://www.osapac.org/software.asp>

<http://www.cricksoft.com/us/>

<http://www.donjohnston.com/index.htm>

<http://www.smarttech.com>

<http://www.nuance.com/naturallyspeaking/home/>

Ministry licensed software list

Clicker 5 software

Write:Outloud and Co:Writer software

Smart Ideas concept mapping software

Dragon Naturally Speaking software

Write:OutLoud SE

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Related Websites

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<http://www.ldonline.org/>
<http://www.linktolearning.com>
<http://www.setbc.org/>
<http://www.tvokids.com>

Source: Julie Mazzuca-Peter has worked as a Speech-Language Pathologist in health care, educational and private practice settings for over 25 years. She is currently working at the Toronto Catholic District School Board in Assistive Technology Services.