

HOT TOPICS

What is Assistive Technology?

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Why is it important for students and families to be involved in AT decision-making?

Students, their families, and caregivers often are the greatest advocates for AT use.

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> *"I have severe dyslexia and it's hard for me to read and write. In the eighth grade, I could not write down a single word. The first time I used a program with voice recognition, I wrote a whole short story. Using AT means I can do things myself and I don't have to depend on someone else to help me."*
>
> Olivia Hampton, I'm Determined Youth Summit, 2019

ASSISTIVE TECHNOLOGY NETWORK

https://atnetwork.ttaconline.org

Assistive Technology Tools in Schools

This guide is designed to support professionals and families in understanding assistive technology (AT), and identifying possible AT tools for students from preschool through high school.

What is Assistive Technology?

Assistive Technology (AT) makes it possible for individuals with disabilities to participate in activities that might otherwise be difficult or impossible for them. AT can provide access to play, school, community, and work activities, and can support communication with others. Often it can be the game changer that helps young children, youth, and adults with disabilities be successful and more independent. It can help students be more independent with reading, writing, math, and organizational skills. Also, AT can help provide access to the general education curriculum. AT ranges from low tech tools (e.g., adapted toys and pencils, reading guides, and graphic organizers) to high tech tools (e.g., computers with reading and writing apps, voice activated tablets, and an eye gaze communication system). AT can be used at any age and in any grade, and there are no prerequisites for its use. Based on the needs of individuals and the technology available, AT use can change over the years.

What about the law and AT?

The federal law defines AT as both a device and a service. According to IDEA (2004) and the *Regulations Governing Special Education Programs for Children with Disabilities in Virginia (2010)*, an AT device is defined as:

> *"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 a child with a disability."*

IDEA 2004 also defines an AT service as:

> *"any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device."*

AT services help individuals with disabilities acquire and use AT. Examples of services include: an assessment to identify devices needed; training for students, families, and teachers; or, the repair of a broken AT device.

IEP teams are required to consider the AT needs of students with disabilities (IDEA, 2004). The Virginia Department of Education promotes the use of a decision-making process such as the *Assistive Technology Consideration Guide* (2018) and the *Virginia Assistive Technology Resource Guide* (2016). Both of these documents are located on the Virginia Assistive Technology Network website, https://atnetwork.ttaconline.org/consideration-at.

References

- Individuals with Disabilities Education Improvement Act of 2004 (IDEA), P.L. 108-446. 20 U.S.C § 1401 et seq.; 34 C.F.R. § 300.1 et seq.
- Virginia Department of Education. (2010). Regulations governing special education programs for children with disabilities in Virginia. Richmond, VA: Virginia Department of Education.

Why is it important for students and families to be involved in AT decision-making?

Students, their families, and caregivers often are the greatest advocates for AT use. Including students and families in AT decision-making ensures that student preferences are honored, and increases the likelihood that the device(s) will be a good match to the student's needs. When students and families have knowledge about AT and how it can be used, they are better advocates for its use in school and at home. Students and families should be invited to participate in the AT decision-making process, to take part in AT trials, and to learn to use the devices. Also, it is important for families to be involved at critical decision points in the student's educational life in order to help make the most effective AT decisions. Some of these critical decision points include transitioning from early intervention to preschool; transitioning from preschool to school-age programs; during times when curriculum and testing decisions are made; during every annual IEP meeting; and during post-high school transition planning.

When the school division purchases AT for the student and the student leaves school for any reason, agreements can be made for the transfer of that AT to the new school, or to the state agency serving the student, or to the student or family. The Virginia Department of Education offers an Assistive Technology Equipment Release/Transfer Request to facilitate this process. This form is located at: **http://bit.ly/2IX9IlbATTransfer.**

What does AT Assessment actually mean?

For some students, AT decisions are simple and straightforward, especially when the need for AT is clearly identified and the AT is easily accessible and available (e.g., highlighters, reading guides, timers). For other students, especially those with more complex needs, AT might be more involved and require a formal AT assessment. According to the Wisconsin Assistive Technology Initiative (WATI, 2017), AT assessment involves: information gathering; the use of a collaborative decision-making process such as the SETT Framework (Student, Environment, Tasks, Tools); device trials; and the development of an implementation plan. Those who need to be involved in looking at these components and making decisions are: IEP team members, including administrators, students, family members/caregivers, and others knowledgeable about AT. All identified AT (devices and services) should be written into the student's IEP.

References

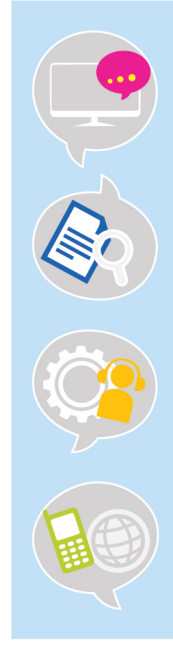
- Wisconsin Assistive Technology Initiative (2017). Retrieved from: **www.wati.org**
- Zabala, J. (2005). Student, Environment, Task, and Tools. Retrieved from: **www.joyzabala.com**

What is an Assistive Technology Team?

Many Virginia school divisions have Assistive Technology Teams. These AT Teams can: assist with developing AT policies and procedures; identify AT needs and make recommendations for the purchase of specific AT; maintain an inventory of the division's AT; and, provide professional development to the division staff and families on AT.



How does Universal Design for Learning help students with disabilities?



Universal Design for Learning (UDL) is a framework based in research that helps teachers design instructional programs that include goals, assessments, methods and materials to meet the diverse needs of the students we serve. UDL considers a variety of ways to engage learners and present information, and it offers different ways that students can show what they know (CAST, 2019). When instruction is designed with the needs of all learners in mind, ALL students are more successful, including those with disabilities. Assistive technologies, by nature, are individualized to meet the needs of specific learners, but when technology that is available to all students includes accessible features, students with disabilities have access to these tools automatically. For example, when word prediction or text-to-speech features are embedded in software available to all students in the computer lab, students with disabilities can be more successful initially without the additional time typically dedicated to AT assessment.

References

- CAST (2019), Universal Design for Learning Guidelines. Retrieved March 17, 2019, from http://bit.ly/2kAYA3nCAST

How can AT be used in school?

Assistive Technology for Literacy

Disabilities that challenge students' abilities to read and/or produce text can have a negative impact in many areas of their educational experience. Assistive technology tools that support reading and writing can give students access to content while they continue to receive literacy instruction and develop their literacy skills. Some of these tools are already present on classroom laptops, tablets, and other devices.

- Accessible Educational Materials, AIM-VA https://aimva.org
- Read & Write http://bit.ly/2lZb05DReadWrite
- Snap and Read https://learningtools.donjohnston.com/product/snap-read/
- Natural Reader http://www.naturalreaders.com/
- Speech to text programs: Dragon, Google Docs, Operating System Dictation
- Voice Dream Reader App
- Reading pens
- Abilipad App
- Claro Scan Pen, Prizmo Go, Office Lens
- Co: Writer, WordQ, word prediction tools
- Office 365 Dictation https://goo.gl/ofQKPv
- Word Banks, such as Clicker 7
- Abbreviation Expansion
- Smart pens, such as LiveScribe
- Ginger/Grammarly extension
- Adobe fill and sign, SnapType, Kami
- Low tech solutions such as:
  - » Adapted pencil grips
  - » Lined paper (commercially purchased or created with Wikki Stix, hot glue, or sewing wheel)
  - » Overlays
  - » Slant boards
  - » Blockers/shades
  - » Highlighters
  - » Sticky note word banks

References

- Center on Technology and Disability https://www.ctdinstitute.org/library
- Accessible Instructional Materials https://aimva.org
- Windows Dictation https://goo.gl/8Ui6sS
- Office 365 Dictation https://goo.gl/ofQKPv
- Google Documents speech to text https://goo.gl/OUIxAS
- Windows Narrator https://goo.gl/E5wZMu
- Text to speech in Google https://goo.gl/ycgnY1
- Windows Immersive Reader https://goo.gl/2ie6KY



Assistive Technology for Math

Assistive technology tools for math can support students with disabilities in a number of ways, including: making abstract concepts more tangible with manipulatives; allowing for the creation of graphs, expressions, and calculations; and providing auditory feedback.

- EquatIO: Make Math Digital https://www.texthelp.com/en-us/products/read-write/read-write-for-google/
- Desmos Online Calculator http://bit.ly/2kdfWTQDESMOS
- Illuminations https://illuminations.nctm.org/
- National Library for Virtual Manipulatives http://nlvm.usu.edu/
- Talking/Accessible Calculators
- Mod Math App, Panther Math Paper App
- Math Learning Center Manipulatives for Chrome and iOS
- Graspable Math https://graspablemath.com
- Graph paper to assist with number alignment
- GeoGebra https://www.geogebra.org/geometry

References

- Understood AT for Math https://goo.gl/h6RDyQ
- UDL Tech Toolkit https://sites.google.com/view/freeudltechtoolkit/math-tools
- WATI Math Resources https://goo.gl/AUJqnq

Assistive Technology for Organization

Students with disabilities whose executive functioning skills need improvement can have a difficult time managing their time, materials, information, and self-management. Assistive technology tools in the area of executive function and organization can help these students by automating steps and simplifying the process.

- Rocket Books www.getrocketbook.com
- Smart Pens, such as Livescribe - https://www.livescribe.com
- Google Keep, Evernote, OneNote
- Color coded tabs for binders/folders
- Reminder apps
- Wearables
- Trello, Cloud Schedule
- Focus apps

References

- OCALI - Executive Function https://goo.gl/C2nKbp
- AT Devices for Study and Organization https://goo.gl/EwQwRp
- WATI Organization https://goo.gl/7ieexb

Assistive Technology for Access

As more and more instructional content is presented through digital media, students with sensory and/or motoric disabilities might need to utilize peripheral software, devices, or built-in accessibility features in order to perceive and/or operate computers and online content.

- Screen readers (JAWS, Zoom Text, etc.)
- Adapted interfaces: modified mice, BIG KEYS, eye gaze systems, voice commands (think modern assistants)
- Built-in features in MacOS, iOS, Android, Chrome OS, and Windows
- Remote desktop programs
- Switches requiring varying levels of input
- Switch interfaces to power battery-powered or plug-in devices
- Switch activated devices such as pouring cups, lights, music shakers, electronic scissors

References

- Microsoft Accessibility https://www.microsoft.com/en-us/accessibility
- Google Support- Chromebook http://bit.ly/2m8ZQv2CHROMEBOOK
- Google Support- Android http://bit.ly/2krraUWSUPPORT
- Apple- Accessibility Mac https://www.apple.com/accessibility/mac/
- Apple- Accessibility iPhone https://www.apple.com/accessibility/iphone/
- American Foundation for the Blind Screen Reader, Info at: http://bit.ly/2lx2zOFScreenReader



Assistive Technology for Communication

Communication is a critical functional skill across all environments. Many students with disabilities will require assistive technology to be able to communicate effectively. When choosing a communication system, the IEP team should be involved in the discussion. In addition, thoughtfully selecting a vocabulary with a base of core words and personal fringe words is essential.

- Paper communication picture or alphabet boards
- PECS (Picture Exchange Communication System)
- Eye gaze frame with picture and/or objects
- Single button voice output devices (e.g., BIGmack, Step-by-Step)
- Multiple button voice output devices with and without levels (e.g., iTalk 2, GoTalk, Tech/Talk)
- Backlit dynamic display devices (e.g., iPads, Windows tablets, Android tablets, other dedicated devices) with software or apps such as, Proloquo2Go, GoTalkNow, Speak4Yourself, LAMP Words for Life, Nova Chat, Tobii Dynavox, and Core First. These are accessed directly through body movements or a pointer, eye gaze, or indirectly with scanning and a switch.

References

- ASHA https://www.asha.org/public/speech/disorders/aac/
- Assistive Technology Internet Modules https://atinternetmodules.org/
- SHAV https://shav.org/

General Resources

- Assistive Technology Internet Modules https://atinternetmodules.org/
- Cook, A. M., Polgar, J. M., & Hussey S. M. (2013). Cook & Hussey's assistive Technologies: Principles and practice. St. Louis, Mo: Mosby Elsevier.
- TechKnowledgy Conference (Virtual and Face-to-face) https://techknowledgy.ttaconline.org/archived-conferences
- Virginia Department of Education's Assistive Technology Network https://atnetwork.ttaconline.org
- Virginia Department of Education, Assistive Technology www.doe.virginia.gov/special_ed/iep_instruct.../assistive_technology/index.shtml
- Virginia Family Special Education Connection https://vafamilysped.org

Assistive Technology for Behavior

Students with behavior needs can benefit from assistive technology to increase their ability to attend to tasks, manage their classwork, promote overall self-regulation, and increase their motivation to complete classroom assignments.

- Visual Schedules: from picture symbols paired with words to only words mounted with VELCRO® and/or magnets and a designated "finished" area
- First-then boards
- Agendas: used to keep track of daily, weekly, and monthly schedules, and tasks to be completed
- Time-keeping strategies: visual timers, reminder watches
- Visuals that bring awareness to voice volume: low tech visuals or apps and websites paired with a microphone
- Visuals to assist in communicating frustration levels
- Visuals to cue request of self-regulation/ sensory supports (i.e., I need ___[tool]) or to cue asking for help
- Behavior cue cards (i.e., quiet hands, raise hand)
- Token boards and token economy behavior systems
- Organizational aides (e.g., dividers, color coded folders and notebooks, appointment books)
- Checklists
- Calendars
- Luggage tag reminders attached to backpack or bag
- Reminder apps or watches



Assistive Technology for Sensory Modulation

Students with sensory needs can also benefit from the use of assistive technology as a tool for self-regulation.

We receive information from our surroundings throughout the day through touch, sight, hearing, body awareness, and more. Some students are sensitive to the sensory input that they receive and need it decreased. Other students need more intense input in order for them to recognize this sensory information. Assistive technology can be used to help reduce or increase input from the environment in order to give students what they need to maintain a calm and focused state of being. For needs with sensory modulation, seek support from an Occupational Therapist.

Assistive technology to decrease sensory input:

- Noise canceling headset, ear plugs
- Visual barriers and strategic seating
- Lower lights, cover lights with a fire safe cover
- Warm lamp lighting instead of overhead lighting
- Paintbrush, other tool, or gloves during messy play activities
- Quiet area for breaks

Assistive technology to provide sensory input:

- Inflated chair cushion
- Wobble stools
- Ball seat
- Standing desk
- Fidgets
- Band on bottom of chair for feet
- Overstuffed bean bag chair
- Purposeful movement breaks (e.g., wall push-ups, desk jumps, hand presses)

Resources

- Positive Behavior Interventions and Supports www.PBIS.org
- VCU Autism Center for Excellence https://vcuautismcenter.org/resources/behavior.cfm



Assistive Technology for Vision

Students who are blind or have a vision impairment might have difficulty seeing and manipulating educational materials, producing work, and navigating around the school. Depending on a student's vision related diagnosis, (s)he could need a variety of assistive technology supports to assist in his/her ability to access educational materials.

AT specific to low vision:

- Prescription eyeglasses
- Low tech magnifiers, including a dome magnifier, magnifying glass, or magnifying sheets
- Video magnifiers such as CCTV
- Zoom settings (computers, tablets), magnifying apps
- Large print textbooks and novels acquired through AIM-VA (https://aimva.org/) or other sources
- High contrast paper documents and tools
- Tinted transparency overlay
- Glare-reducing overlay
- Touch screen on computer monitor to allow direct access
- Writing guides
- Slant board
- Task lighting
- Adapted keyboard (enlarged keys or backlit keyboard)
- Lightbox and accompanying materials

AT using audio:

- Descriptive video or audio description
- Screen reader (e.g., ChromeVox, Voice over, ZoomText)
- Text-to-speech apps, extensions, and software to access documents, websites, textbooks, and novels
- Notetaking and/or recording apps
- Talking calculators
- Talking watch and clock

AT using sense of touch:

- Wikki Stix, hot glue, foam stickers, braille labels, and/or 3D printed symbols can be added to surfaces to provide touch input.
- Commercially made raised line and textured educational materials (i.e., maps, pictures)
- Braille printers to print braille accessible materials and labels

- Tactile tools and manipulatives (i.e., rulers with raised lines)
- Raised line paper
- Divided or scoop plates
- Divided tray, desk or work area
- Tactile schedule
- Braille keyboard
- Braille textbooks and novels acquired from AIM-VA (https://aimva.org) or other sources

Orientation and mobility -

- White canes
- Auditory input (i.e., crossing walk cues)
- Texture on floor to assist with navigation
- Braille/tactile signs
- Sound alerts
- Global positioning system apps and devices

Resources

- Virginia Department for the Blind and Vision Impaired (DBVI)
  https://www.vdbvi.org/



Assistive Technology for Hearing

Students who are deaf and/or hard of hearing have difficulty receiving auditory information from their teachers and peers. Assistive technology can help by providing visual or tactile information to supplement or replace auditory input.

Visual and tactile input:

- Closed captions settings (YouTube, educational websites)
- Real time captioning
- Digital recorder with indexing capability
- Speech-to-text application to convert teacher lecture to text
- Verbal directions from teacher and responses from student presented in writing or typed
- Flashing light or vibration alerts on phone or alarm clock
- TTY/TDD (Teletype) communication system for phones
- Other environmental alert systems

Amplification:

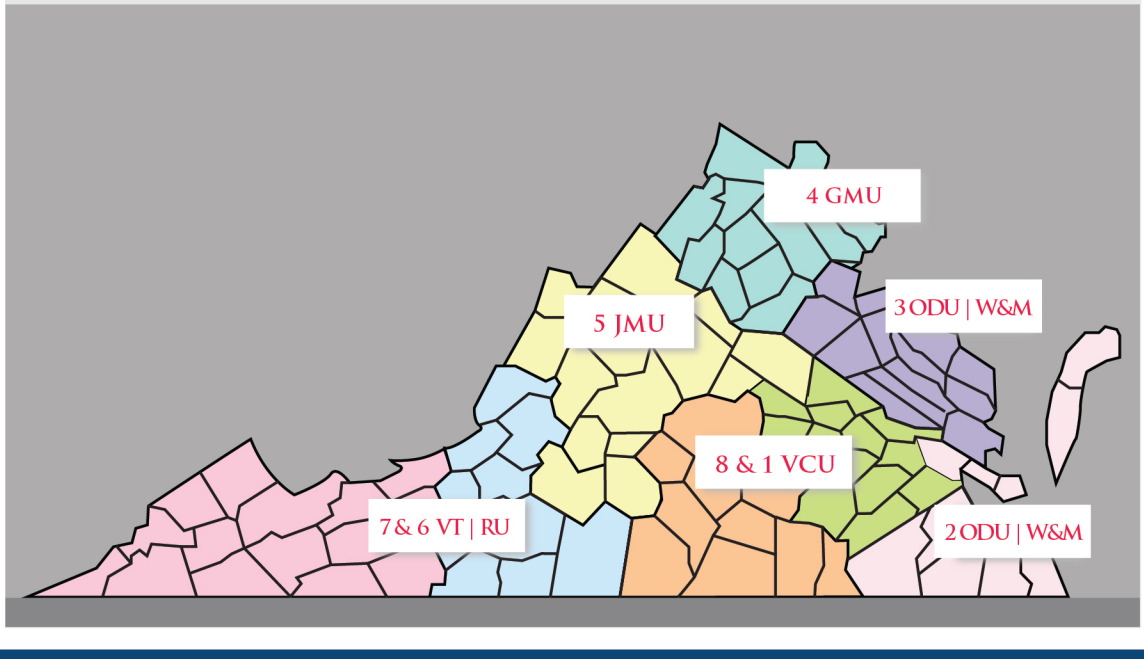
- Personal hearing aids and/or cochlear implants
- FM amplification system and/or auditory trainer
- Classroom sound-field system

Resources

- Virginia Department for the Deaf and Hard of Hearing (VDDHH)
  https://www.vddhh.org/
- Laurent Clerc National Deaf Education Center
  http://www3.gallaudet.edu/clerc-center/our-resources.html

This guide was developed by the VDOE Assistive Technology Network (2019). The identification of any products, private vendors, or links to websites in this guide is only for the purpose of providing examples and information and does not constitute the VDOE's endorsement of these products. Selection of products and implementation of practices should be based on individual student needs and local regulations and policies.

Virginia Department of Education's state- wide Training and Technical Assistance Centers (TTACs) provide professional development and support designed to assist schools in addressing accountability and improvement goals for students with disabilities.



Regional TTACs

http://ttaconline.org/regional-ttacs

Regions 1 & 8

Virginia Commonwealth University, Richmond, VA
(800) 426-1595 • https://ttac.vcu.edu/

Regions 2 & 3

Old Dominion University, Norfolk, VA
(800) 249-5529 • http://ttac.odu.edu/

The College of William and Mary, Williamsburg, VA
(800) 323-4489 • https://education.wm.edu/centers/ttac/

Region 4

George Mason University, Manassas, VA
(703) 993-4496 • https://ttac.gmu.edu/

Region 5

James Madison University, Harrisonburg, VA
(888) 205-4824 • https://www.ttacjmu.org/

Regions 6 & 7

Virginia Polytechnic Institute and State University, Blacksburg, VA
(800) 848-2714 • https://www.ttac.vt.edu/

Radford University, Radford, VA
(877) 544-1918 • https://www.radford.edu/content/cehd/home/ttac.html


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http://www.doe.virginia.gov/