

Tech for Understanding:

An Introduction to Assistive and Instructional Technology in the Classroom

Taylor Caldwell, Dr. Randall Dunn, Dr. Lucinda Spaulding

Abstract

This project examines the different types of assistive and instructional technology available to students who are classified with one or more of the thirteen disabilities outlined in the Individuals with Disabilities Education Act (referred to as, IDEA). While the roles of assistive and instructional technology are different, there are many instances where their uses may overlap. Thus, while these two categories will be discussed separately, it should be noted that some information may be applied to each category and more than one piece of technology. The purpose of this paper is to provide an introduction to the world of assistive and instructional technology for those who may be new to its concepts, particularly parents who have recently learned that their child may benefit from extra assistance and future educators who are interested in learning more about the devices they will be using to reach their students. Each of the thirteen disabilities will be discussed briefly, and then each disability will be assigned several types of assistive and instructional technology that serve it well. This will by no means be an exhaustive list of all types of technology available to teachers, parents, and students. However, it will attempt to provide a varied glimpse at some of the options that are available and how they may help children who are struggling to access the curriculum.

Categories of Disabilities (IDEA)

- Autism (AU)
- Deafness (d), Hearing Loss (HL) (including Blindness), and Deaf-Blindness (DB)
- Developmental Delay (DD)
- Emotional Disturbance (ED)
- Intellectual Disabilities (ID)
- Multiple Disabilities (MD)
- Orthopedic Impairment (OI)
- Other Health Impairment (OHI)
- Specific Learning Disability (SLD)
- Speech or Language Impairment (SLI)
- Traumatic Brain Injury (TBI)
- Visual Impairment, Including Blindness (VI)

Conclusion

The needs of students are absolutely infinite. However, the world of assistive and instructional technology is incredibly vast and is expanding all the time. However, it is also important to remember that, while technology serves a significant part of the educational process, it does not educate children. Just as Bill Gates said, "Technology is just a tool. In terms of getting the kids working tougher and motivating them, the teacher is the most important" (The Telegraph, 2017). There is no possible way to replace or replicate the impact teachers have on their students. Now, this impact can be either positive or negative, and it should be the goal of each teacher to make sure it is positive. This influence cannot be undermined, nor should it be taken for granted. Each and every student has the ability to reach the highest of peaks with a little help from their teacher and maybe some technology.

Disability/Technology Matrix

KEY:
★ Primary (disability most likely to benefit)
✓ Secondary (disabilities also to benefit)

Technology	IDEA Disabilities												
	AU	d, HL, DB	DD	ED	ID	OI	OHI	SLD	SLI	TBI	VI		
Alerting Devices		✓								★			
Alternative Input Devices						★							
Alternative Keyboards						★							
Assignment Book	✓		✓				✓	✓		★			
Audio Graphing Calculator												★	
Audiobooks	✓		★					✓	✓			✓	
Augmentative and Alternative Communication Systems			✓			✓			★				
Babakus	✓							★					
Beanbags	✓		✓	✓		★	✓	✓					
Braille and Adapted Math Tools												★	
Braille Printers and Notetakes												★	
Closed Captioning		★						✓	✓				
FM Systems		✓	★										
Graphic Organizers	★		✓				✓	✓		✓			
Memory Books			✓								★		
Navigational Aids			✓								★		
Noise-Canceling Earphones	✓			✓			★					✓	
Note Taker	✓		✓				✓			★		✓	
Picture Prompts	✓		✓	✓	★			✓		✓			
Real-life Manipulatives	✓		✓		★			✓		✓			
Recordings of Class Presentations			✓					✓					
Self-Management Programs	✓			★				✓		✓			
Speech Recognition Software		★				✓		✓					
Stress Management Devices	★			✓									
Surveys and Polls	✓						★	✓					
Tabletop Displays	★											★	
Talking Dictionary												★	
Text Readers												★	
Video Modeling	★												
Videos	✓		✓			✓		★	✓	✓			
Visual Schedules	★												
Vocal Output Communication Aids	★												
Word Prediction Software									★				

References

Assistive Technology Act of 2004, Pub. L. No. 108-364, 118 Stat. 1707 (2004).

Boser, K. I., Goodwin, W. S., & Wayland, S. C. (2014). *Technology tools for students with autism: Innovations that enhance independence and learning*. Baltimore, Maryland: Paul H. Brookes, Publishing Co.

Center for Parent Information & Resources. (2017). Categories of Disability Under IDEA. Retrieved from: <https://www.parentcenterhub.org/categories/>

Cognitive Centre. (n.d.) Dyscalculia and Babakus. Retrieved from: <http://www.dyscalculiainfo.org>

Disability. (n.d.). In *Merriman Webster online*. Retrieved from: <https://www.merriam-webster.com/dictionary/disability>

Georgia Department of Education. (n.d.). Word Prediction Software. Retrieved from: <http://www.gpat.org/Georgia-Project-for-Assistive-Technology/Pages/WS-Word-Prediction-Software.aspx>

Green, J. L. (2011). *The Ultimate Guide to Assistive Technology in Special Education*. Waco, TX: Prufrock Press Inc.

Hunt, N. & Marshall, K. (2013). *Exceptional children and youth (5th edition)*. California: Wadsworth Publishing.

IDEA. (n.d.). Sec. 300.8 (c) (10). Retrieved from: <https://sites.ed.gov/idea/regs/b/a/300.8/c/10>

Illinois University Library. (2018). Speech Disorders: Common Assistive Technologies. Retrieved from: <http://guides.library.illinois.edu/c.php?g=613892&p=4265891>

Infinitec. (n.d.). Alternative Keyboards. Retrieved from: <http://www.infinitec.org/alternative-keyboards>

Johnson, K., & Hamiss, M. (2016). Assistive Technology in Traumatic Brain Injury. In F. Zollman (Ed), *Manual of Traumatic Brain Injury: Assessment and Management (2nd Ed)* (pp. 308-314). New York: Demos Medical.

Kasper, Erica. (n.d.). Tourette's Assistive Classroom Technology. Retrieved from: <https://classroom.synonym.com/tourettes-assistive-classroom-technology-12084.html>

Keating, D. (2008). *Assistive technology for visually impaired and blind people*. Retrieved from: <https://ebookcentral.proquest.com>

Lynch, M. (2018). Assistive Technology to Help Students with Developmental Delays Succeed Academically. Retrieved from: <https://www.thetechedvocate.org/assistive-technology-to-help-students-with-developmental-delays-succeed-academically/>

Mechling, L. C. (2007). Assistive Technology as a Self-Management Tool for Prompting Students with Intellectual Disabilities to Initiate and Complete Daily Tasks: A Literature Review. *Education and Training in Developmental Disabilities, 42(3)*, 252-269. http://daddeec.org/Portals/0/CEC/Autism_Disabilities/Research/Publications/Education_Training_Development_Disabilities/2007v42_Journals/ETDD_200709v42n3p252-269_Assistive_Technology_Self-Management_Tool_Prompting_Students.pdf

National Association of Special Education Teachers. (n.d.). *Assistive Technology for Students with Autism Spectrum Disorders*. Retrieved from: https://www.naset.org/fileadmin/user_upload/Autism_Series/Assist_tech/AssistiveTech_for_Students_W_Autism.pdf

National Center for Technology Innovation. (n.d.). Speech Recognition for Learning. Retrieved from: <http://www.idonline.org/article/38655/>

National Institute on Deafness and Other Communication Disorders. (2017). Assistive Devices for People with Hearing, Voice, Speech, or Language Disorders. Retrieved from: <https://www.nidcd.nih.gov/health/assistive-devices-people-hearing-voice-speech-or-language-disorders>

Shepley, C., Lane, J.D., Ayres, K., & Douglas, K.H. (2015) Assistive and Instructional Technology: Understanding the Differences to Enhance Programming and Teaching. *Young Exceptional Children, 20(2)*, 86-98. DOI: 10.1177/1096250615603436

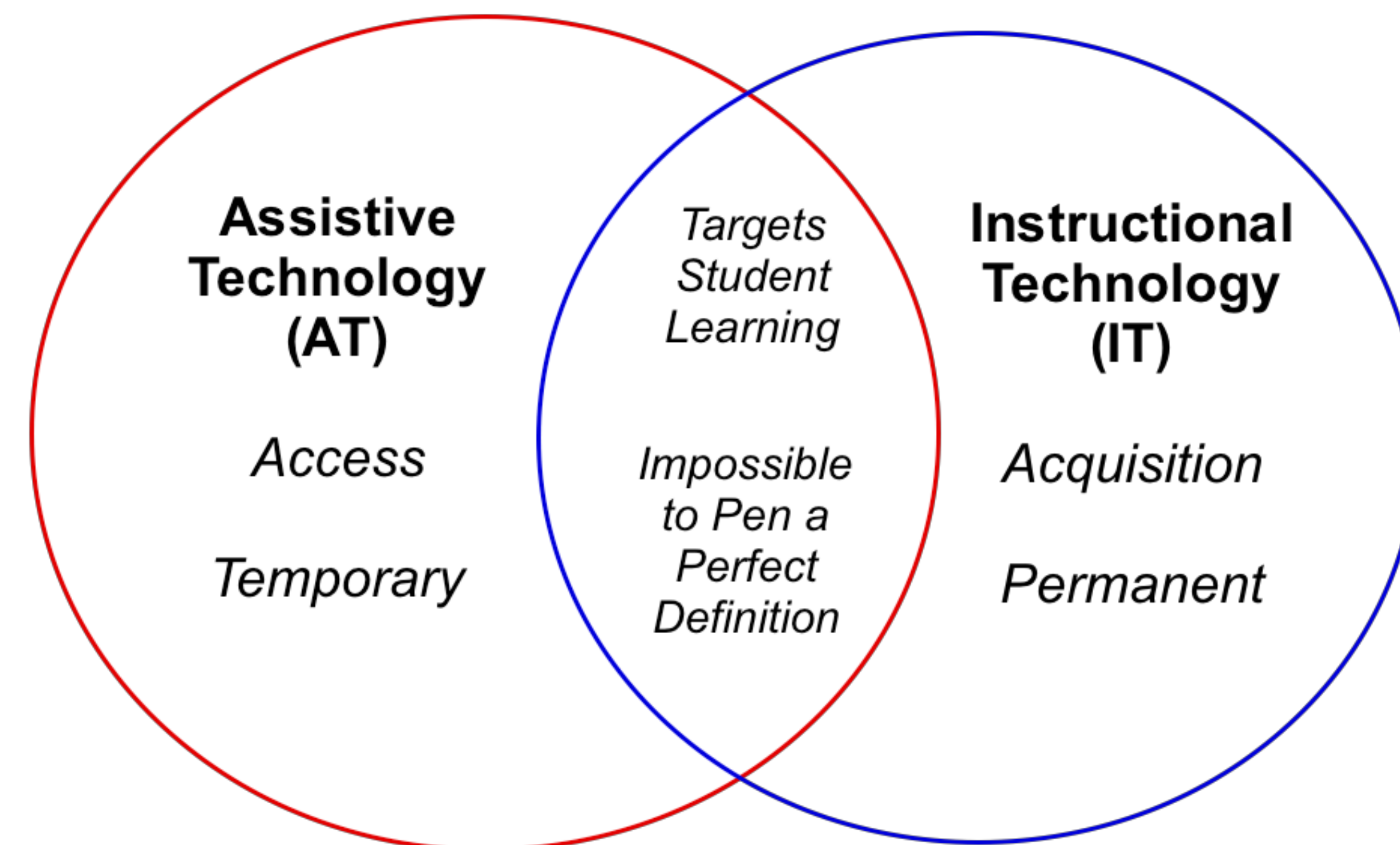
The Telegraph. (2017). Bill Gates quotes: words of wisdom from the Microsoft mogul. Retrieved from: <https://www.telegraph.co.uk/technology/0/bill-gates-quotes-words-wisdom-microsoft-mogul/>

UC Berkeley. (n.d.). Types of Assistive Technology. Retrieved from: <https://webaccess.berkeley.edu/resources/assistive-technology>

ViewPlus. (n.d.). Audio Graphing Calculator. Retrieved from <https://viewplus.com/product/audio-graphing-calculator/>

Walsh, K. (2014). 10 of the Most Engaging Uses of Instructional Technology. Retrieved from: <https://www.emergingtech.com/2014/09/most-engaging-uses-of-instructional-technology/>

AT & IT



Case Study

Jayden is a fourth grade student with attention deficit hyperactivity disorder (ADHD) who has recently received a diagnosis of high functioning autism spectrum disorder (ASD). During instructional time, Jayden struggles to maintain attention to his tasks. He often glancing around the room and taping his pencil on his leg. When his teacher asks him a question, he often does not remember the question that was asked. When this happens, he becomes extremely frustrated with himself and he taps his pencil on his leg in a more intense manner. In rare situations, he becomes extremely embarrassed and will become irritable and may verbally lash out towards his teachers and peers. When asked about his school experiences, Jayden replied that "the teacher moves too fast and doesn't talk about everything that she gives me for homework." His grades in third grade had begun to drop before the school year, and he said the reason was because "I've never seen this before." What resources are available to you, Jayden's teacher, as you help Jayden combat these challenges and guide him to achieve his educational goals?

