Assistive Technology Resources for Children and Adults with Disabilities

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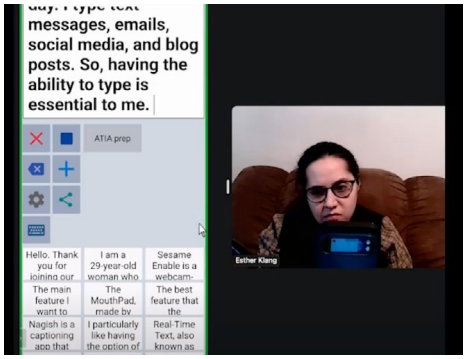
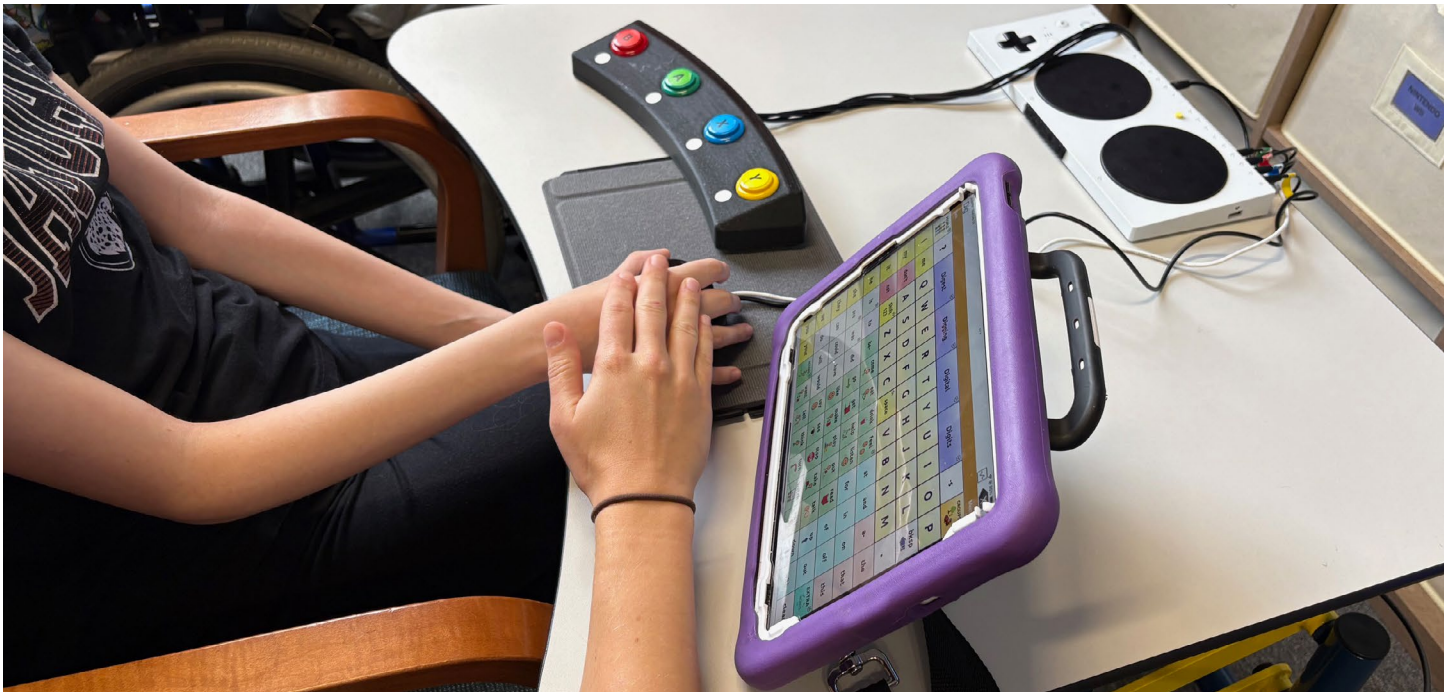


Social gaming:

The intersection between functional communication and adaptive gaming for pediatric clients

Summary: After reading this article, readers will learn about an exciting style of group therapy focusing on functional communication using video gaming as a fun and motivating activity. The "Game n' Gab" group brings a multidisciplinary approach between speech and occupational therapies blending communication and access. Readers will see how gaming can be used as a powerful method for engagement, leading to increased communicative efforts between group members. Readers will receive insight into how to incorporate principles and methods outlined in their own settings.



RILEY HANLINE is an Occupational Therapist with a strong passion for assistive technology and adaptive gaming, dedicated to empowering individuals with disabilities. Currently, Riley works in the Adaptive Computer and Communication Technologies (ACCT) department at AbilityKC, providing innovative assistive tools designed to help clients thrive in education, work, and daily life. In addition, Riley works with ReSpawn Foundation, a nonprofit organization committed to advancing inclusion of adaptive gaming within hospital and rehabilitation settings, providing education and therapist support to those served.

LILY MACHALEK is a Speech-Language Pathologist (SLP) with a specialized focus on Augmentative and Alternative Communication (AAC). With a passion for empowering individuals with communication needs, Lily has built a career dedicated to providing high-quality, individualized treatment and evaluation services to individuals across the lifespan who require alternate methods of communication. Currently, Lily works within the Adaptive Computer and Communication Technologies (ACCT) department at AbilityKC where she primarily focuses on evaluating and providing therapeutic services for individuals who use communication devices, ensuring that each person's needs are met with the most appropriate technology and interventions.

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Increasingly in modern culture, video games have become a ubiquitous medium for leisure activity and engagement, in addition to being an extremely common social pastime for much of the American population. According to the Entertainment Software Association, there are over 205 million Americans playing video games at least an hour each week, with over 85% of Gen Alpha and Gen Z playing. More children than ever are using video games as a primary source of social engagement and connection, as many games are cooperative in nature, and support shared collaboration efforts between players. Close to 80% of Gen Alpha and Gen Z report playing games with friends and being introduced to new friends through video games. With a unique ability to contrive fun, motivating, and rewarding social interactions, video games offer a powerful leisure activity to increase engagement in social situations. However, with many video games requiring precise controls and specific motor skills for success within the game, the activity previously has been a highly inaccessible activity for children with disabilities.

In the last half-decade, there has been an explosion in support for adaptive gaming from large video game companies. There are now more options than ever for children with disabilities to engage with video games previously thought inaccessible due to physical or cognitive barriers. Products like the Xbox adaptive controller, PlayStation access controller, and Hori flex controller have enabled access to gaming otherwise thought impossible. Using this unique and bespoke equipment, playing video games has become accessible to a large audience of people with disabilities, and have been able to engage with their like-minded peers who want to enjoy the occupation of gaming. Disabled siblings, peers, classmates, and more now can socially engage and connect on a level previously thought impossible.

Morghan and Axton work together to play *Paw Patrol.*

As gaming becomes more accessible to a variety of populations with severe physical or intellectual disabilities, there arises a unique opportunity to use gaming as a motivating factor for social engagement with peers. AbilityKC, a comprehensive outpatient rehabilitation facility in Kansas City, offers this opportunity through a group model for clients with both physical access and social communication needs. Group participants are those that require training for functional communication through their speech generating device (SGD), with gaming being a motivating, fun, and rewarding experience for clients to engage with. Through a multidisciplinary approach, clients are evaluated for access needs by an occupational therapist who provides ongoing support for personalized setups to allow engagement with the video game, while a speech therapist encourages communication using cooperative video games as a motivating and engaging stimulus. The result offers clients a sense of empowerment and fulfillment, as they are enabled to access a previously inaccessible activity that many of their peers are engaging in, all while bringing social opportunities to facilitate increased functional communication through use of their SGD. This article seeks to highlight the group that was started and share lived experiences of the children and their families.

THE BEGINNING

The idea for the group started with a medically complex client – Axton – and the journey to provide him with engaging and motivating activities to spark use of his SGD. Axton presents with an anoxic brain injury, which has left him virtually paralyzed with very little movement capabilities in his head and extremities. Switch access was very minimal – with just a little movement at the head – and eyegaze quickly became the necessary and chosen access method. Using TD Snap on his i13 device, he communicates to caregivers his basic needs and an expanding vocabulary as he continues training. His ACCT speech language pathologist, Lily Machalek, would spend sessions trying various activities, such as switch activated toys, music, art, and vestibular input. Axton would then use his device to engage with the activity through decision making or commentary. However, activities quickly became stale, and engagement with his device would decrease session over session. After a while, Lily eventually requested a co-treat with Riley Hanline, the occupational therapist within the ACCT department.

To further explain how the group was able to come into being, it becomes necessary to delineate services offered at the facility where the group takes place. AbilityKC, a large outpatient rehabilitation facility based in Kansas City, MO, offers a comprehensive suite of outpatient services including a unique day program model, in addition to specialty departments. One of the specialty departments at AbilityKC is the Adaptive Com-

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Participants use the 'Xbox Controller Assist' feature to play cooperatively.

puter and Communication Technology (ACCT) program, which provides assistive technology solutions to patients, including augmentative and alternative communication (AAC), and adaptive gaming. The ACCT department hires full-time therapists to work exclusively with assistive technology as their primary job duties. Within the department, Lily, the SLP, and Riley, the OT, are often able to combine areas of expertise resulting in functional outcomes. As such, it was only natural for Lily to pull in Riley to assist with Axton.

During that initial co-treat, Axton was observed to have much more engagement with the activity, as evidenced by more frequent device activations and less closing of his eyes. He was able to engage with his device more often and participate in an activity with an immediate response to an action that he performed, rather than one that was done for him. Lily noted that he had not ever shown as much volition and excitement with an activity prior to trying gaming. From this initial treatment, it became clear that using gaming as an activity could provide clear motivation to utilize a SGD, and continue training and device mastery even past typical speech treatment. It was at this time that Lily produced the idea for a multidisciplinary group, one that melds the expertise of ST and OT, working on distinct goals of communication and access. Both disciplines could each target specific goals tied to their respective areas, but work towards a very functional outcome, one in which the group participant could use their device to communicate in addition to accessing an extremely common pastime that their same-age peers are doing. Now that the idea was formed, it was time to recruit the other group members, and to identify what adaptive gaming equipment was needed to run the group.

EQUIPMENT

The equipment used to make the group work and enable access for the kids is a mix of officially made tools from first party companies such as Microsoft, and third-party adaptive equipment from various other organizations and makers. For Axton, several pieces needed to be sourced for his access. Pretorian Technologies, an AT company that makes several types of equip-

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ment, makes a device called the "Game on 1", an infrared receiver box that works by plugging into an Xbox adaptive controller (XAC). The box accepts infrared signals that an AAC device can send, using a custom page within grid, also made by Pretorian. With this setup, Axton can use his access method of eyegaze to interact and play independently with his peers. Custom gaming page sets for Axton often included large accessible buttons for gameplay engagement, in addition to speech buttons to remark on gameplay and for interactions with peers. For Axton's fellow group members, there was a mix of other types of gaming equipment used.

Other group members, with more available physical moves for access to controllers or equipment, use different types of switches, joysticks, and standard controllers, all made possible with the XAC. As referenced before, the XAC is an adaptive controller which functions as a switch interface for an Xbox console. Most games that were played required 2-4 buttons and one joystick, and each group member would be set up with the relevant number of inputs needed. A common setup could include an 'A' button and a 'B' button, in addition to an external joystick to control character movement, all plugged into the XAC. This could allow a group member to move their character and perform a jump and interact style action. At times, standard controllers could be utilized as well, in addition to use of the 'Xbox controller assist' feature. Xbox controller assist allows two controllers to work together to control one in game character or game piece, allowing for a natural way to spark communication between group members, and account for increased complexity of inputs required from the player. With all these hardware options available to the group members, an equally critical issue needed careful consideration: game selection.

THE GAMES

Game selection from the beginning was an important part of group creation and quickly became a complex issue needing careful thought and consideration. Not only did games need to be physically accessible to all group members, but they also needed to be age appropriate, interesting, provide clear objectives, and foster communication between players. To illustrate the selection process and why certain games were chosen, Paw

Riley double checks to make sure switches are plugged into correct places.

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Patrol: World will be used to frame all considerations in the selection process. In this game, players play as various Paw Patrol characters, being put into a town with clear objectives and missions outlined. Mission examples include saving a bird from a tree using the firefighter character named Marshall or finding a lost cat using the police character Chase. Missions and objectives all follow under a larger objective under the overarching story, to save the annual Paw Patrol Day Festival from the Mayor Humdinger character. As Paw Patrol was an interesting and engaging IP for kids in the group, it seemed a natural fit, especially as the physical and cognitive requirements matched with group member needs.

Physically, this game requires several inputs, with one joystick needed to move characters, and 2-4 buttons to control actions such as jump, interact, and switch characters. For one group member, it may have been challenging to control all inputs with the necessary coordination and cognition required. However, with Xbox controller assist, two group members could be paired, to allow one member to control joystick movement, and one group member to control the jump and interact options. In this manner, peers would receive controls that were conducive to physical access, in addition to requiring communication to proceed in the game and perform successful actions.

For example, a mission within the game required players to clean-up a bridge with scattered treats which blocked the flow of traffic. Players had to direct character movement toward the bridge, switch to the 'Rubble' character, and use his construction bulldozer to clean up the mess. This mission required one player to move the character, and their peer to press the necessary buttons for character switching and vehicle use. Throughout the mission, players would have to communicate to talk about where to go, which character to switch to, and what actions to perform. In this way, simple missions within the game fostered communication, supported physical access, and captured attention and engagement. Other games were likewise chosen for similar reasons. Examples of other games played were Rush: a Disney-Pixar Adventure, Disneyland Adventures, and digital board games like Monopoly and Uno.

FORMAT & PARTICIPANTS

Group formatting was chosen to support communicative efforts throughout and provide opportunities for interaction and engagement. Members were chosen based on age range and general cognitive abilities, communicative goals needing work, and access abilities. The group ran once a week in 1-hour blocks, with multidisciplinary group codes being used to bill insurance. At the start of each group, social greetings were encouraged in addition to introduction of the chosen game and controls needed, along with instructions for how to play. During gameplay, clinicians provided natural models of communication and individualized prompting to each kid based on skill level, method of communication, and learning style. During breaks, clinicians would provide opportunities for communication through answering questions about the game, making group decisions about gameplay, and sharing opinions about game. End of sessions would include closing thoughts about the day, and goodbyes.

Lily supports Morghan's use of a dome style joystick.

To highlight examples of strong candidates for the Game n' Gab group, other group members that played alongside Axton can be highlighted. Morghan is a teenage girl with a diagnosis of selective mutism and TBI, who uses an AAC device to support her language. Physically, she can access a standard controller and utilize spoken language but often benefits from both AAC and adaptive gaming equipment to support her communication and access. Adaptive gaming equipment also simplifies access, enabling her to focus on 1-2 inputs and giving her increased bandwidth to focus on communication and collaborating with peers for in-game success.

Another group member is Jacob. Jacob has a diagnosis of quadriplegic cerebral palsy and presents in a manual wheelchair. He is a very sociable kid and prefers to use his voice to communicate but often needs AAC device assistance due to significant dysarthria. Physically, he has spasticity in all extremities causing increased tone. This tone inhibits his ability to access standard controllers and as a result Jacob needs the use of external joysticks and switches to enable gameplay. He also uses a device called the Lipsync, a sip and puff controller that allows him to

control movements with his head.

The final group member is Sara, with a diagnosis of SCA 19 gene mutation, leading to deficits in upper extremity coordination and strength, fine motor control, and visual perception and motor difficulties. Although she can use her voice to communicate, she has an AAC device to assist with communication breakdowns.

Overall, all group members qualified for inclusion due to being interested and motivated by video games, in addition to benefitting from gaming as a central activity to spark communication and collaboration.

POSITIVE OUTCOMES

Over the course of the latter half of 2025 and into 2026, there have been many noted benefits from group delivery. In the larger picture, many subjective benefits were observed from group members and their families. Parents have reported the group being the highlight of their week, with kids not wanting to miss group time even when not feeling well. Parents have made comments that they never thought their child could participate in an activity like this, noting the physical and communicative barriers present. Families even report carryover to the home environment, with several kids playing with family members after being shown how to set up controls.

Relating to individual outcomes, Morghan was noted to increase spontaneous remarks, in addition to general fading of prompting to initiate social interaction. Full verbal models and prompts were introduced and used with new games, and over time Morghan was able to interact with fading of prompts first to cloze phrases and finally to light verbal hints. For Jacob and Sara, the group provided a natural and real-life setting for AAC device use and implementation, in addition to participating in a same age peer activity not normally available. Axton benefited from volitional and independent access to an activity never thought possible due to enablement using adaptive gaming equipment. In the end, the group has provided numerous benefits for all individuals involved, providing tangible opportunities for social engagement sorely lacking for these types of populations.

CHALLENGES

The group was not without its challenges, especially a new group without much precedent. Taking structured group data for interactions was a challenge, as much time of the therapists was spent encouraging and assisting with communication, or supporting physical access to games. Game selection was an ever-evolving struggle, as games had to work on numerous levels, including being fun, offering an accessible experience, and age-appropriate. For other facilities, a dedicated space and the time allotted to therapists may not be within the scope of treatment delivery. In addition, knowledge of video games and adaptive gaming equipment may be required for initial setup. Billing may be an issue as the financials of each facility can vary, in addition to finding group members with billable insurance.

Riley adjusts Jacob's joystick positioning.

NEXT STEPS

Despite these challenges, the Game n' Gab group presents a unique and interesting style of treatment that may warrant further iteration and evolution. One hope from this article being written is that other therapists will see the value of a social gaming group and offer their own versions with their own improvements and enhancements. For AbilityKC, future offerings may benefit from more structured programming and activities, with fleshed out lesson plans and data sheets to further show objective improvements in communication and access. It is the hope that this group continues to grow and iterate, increasing access and social opportunities for a population that sorely needs it.

PRODUCT INFORMATION

- AAC Device with mount
- Xbox Adaptive Controller ($100) - https://www.xbox.com/en-US/accessories/controllers/xbox-adaptive-controller
- Logitech adaptive gaming kit ($100) - https://www.logitechg.com/en-us/shop/p/adaptive-gaming-kit-accessories.943-000318?utm_source=-Google&utm_medium=Paid-Search&utm_campaign=DEPT_FY26_Q3_USA_GA_B2C_Always-on-Gaming-Base-Plan_Google_CVR_na&gclsrc=aw.ds&gad_source=1&gad_campaignid=21344440017&gbraid=0AAAADDQ2OxKUMfjWHwak2ObLfy-QORr8K&gclid=Cj0KCQiA18DMBhDeARIsABtYwT1gln9WOI-9RiWUYDQQ-ZvO5rLLYNohhBregvttLM7mTKecTA1CH9iQaAl-8JEALw_wcB
- External joystick – Various Sellers, no official 'best-in-class'. Example Etsy seller: https://www.etsy.com/shop/SevenMileMountain?ref=shop-header-name&listing_id=1688829136&from_page=listing&section_id=37784302
- Praetorian IR box ($435) - https://www.inclusivetlc.com/shop/game-on-1/
- Lipsync ($325) - https://www.makersmakingchange.com/product/lipsync/01tJR000000698fYAA ■

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Using Artificial Intelligence to Support Students with Disabilities with Writing

In today's schools, teachers assess student knowledge and understanding via writing. In history class, students are expected to detail the events that led up to the signing of the Declaration of Independence in a well-structured essay. In English class, students present well-cited argumentative papers on controversial issues to persuade readers. Writing is a complex and challenging activity for all students, but particularly those with disabilities (Graham et al., 2017).

To write a cohesive and coherent essay, students must first ground their work by understanding the topic and possessing the necessary background knowledge. Keeping their overall argumentative purpose in mind, they must organize their ideas into a structure, such as the five-paragraph essay, often starting with pre-writing or brainstorming. Once drafting begins, the student must simultaneously manage an overwhelming cascade of tasks: they must hold the paragraph's focus while constructing a strong topic sentence; they must formulate the content for the sentence while applying the rules of grammar and syntax (like subject-verb agreement); and finally, they must manage the lowest-level tasks. These mechanics involve recalling the precise words, translating sounds into correct spelling (letter-by-letter), applying capitalization and punctuation rules, and even coordinating the fine motor skills required to physically draw the letters without ripping the paper. The act of holding all these conceptual, structural, and mechanical demands in working memory at once is what makes the writing process profoundly exhausting for all learners, especially those who struggle with writing (Goldman, Carreon, Smith & Zimmerman, 2024).

UNDERSTANDING WRITING CHALLENGES ACROSS DISABILITIES

For students with disabilities, these challenges are frequently intensified. Students with learning disabilities, for example, may struggle with spelling, sentence construction, or organizing ideas (Graham et al., 2017). Students with attention-deficit/hyperactivity disorder (ADHD) may find it difficult to sustain focus, plan, or monitor their work (Creelman, 2021). Students with fine motor challenges may expend significant effort simply to form letters (Seyll & Content, 2020). Others may struggle with language processing, making it difficult to translate their thoughts into written words (Williams & Larkin, 2023). When these challenges accumulate, writing becomes less about expressing ideas and more about managing barriers.

Students with language-based disabilities may also struggle with narrative structure, cohesion, and academic language (Williams & Larkin, 2023). Writing tasks that require explaining relationships, describing cause and effect, or making inferences can be especially difficult when students have limited access to the language structures needed to do so. As a result, teachers may see writing that appears off-topic or underdeveloped, even

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DR. SEAN J. SMITH is a Professor of Special Education at the University of Kansas and a nationally recognized researcher, presenter, scholar, and author. His work centers on the practical use of technology and artificial intelligence to support teaching and learning for all students. Dr. Smith has worked with thousands of teachers and school leaders across the country, helping them implement effective, tech-supported strategies in PreK–12 classrooms. He also leads multiple federally funded research projects focused on AI-driven tools that enhance student learning and educator effectiveness.

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when the student has a solid conceptual understanding of the content.

For students with autism spectrum disorder in need of level one supports, writing challenges often relate to organization, perspective-taking, and flexibility (Hilvert et al., 2019). These students may produce writing that is highly detailed in one area but lacks overall coherence, or writing that accounts for the needs of treader's needsties with executive functioning can make planning, revising, and self-monitoring especially taxing, while challenges with. At the same time, communication may affect persuasive or narrative writing tasks that require understanding an audience's or a character's motivations.

Students with intellectual disabilities also face unique writing challenges. These students often require significant scaffolding to engage in writing tasks, including support with idea generation, sentence construction, and sustaining effort over time (Bakken et al., 2022). Traditional writing assignments may place an unrealistic emphasis on independence, unintentionally limiting students' opportunities to demonstrate their understanding fully. With appropriate supports, however, students with intellectual disabilities can participate in authentic writing experiences that emphasize communication and expression rather than mechanics alone.

Writing can also be particularly challenging for students with physical disabilities or motor impairments. When handwriting or keyboarding requires substantial effort, students may devote most of their cognitive resources to the physical act of writing, leaving little capacity for higher-level thinking such as idea development or organization. In these cases, writing output may significantly underestimate what the student knows or is capable of expressing.

Across disability groups, a common theme emerges: writing often creates multiple barriers to students' ability to communicate knowledge, ideas, and understanding. When these barriers are not addressed, writing assessments may reflect a student's disability-related challenges more than their true learning. Recognizing this complexity is essential for educators seeking to design instruction and supports that allow all students to participate meaningfully in writing tasks.

Compounding the difficulty, many struggling writers are also struggling readers (Bones & Bouck, 2017). Writing assignments often require students to read and comprehend complex texts, extract key information, and integrate evidence into their writing. For these students, the cognitive load begins long before they start drafting. By the time they are asked to write, their mental resources may already be depleted. As a result, writing tasks can mask what students truly know, understand, or can do, particularly when expectations emphasize mechanics and structure over meaning.

ASSISTIVE TECHNOLOGY AS A FOUNDATION FOR WRITING SUPPORT

For decades, Individualized Education Program (IEP) teams have relied on assistive technology (AT) as a cornerstone of support for students with disabilities who struggle with writing. Tools such as word prediction, speech recognition, and text-to-speech have long been used to reduce barriers related to transcription, spelling, language formulation, and access to text. These tools have enabled students to more fully engage in the writing process by allowing them to focus on ideas and meaning rather than the mechanics of writing alone.

Many of the AT tools educators rely on today have long incorporated forms of artificial intelligence (AI) to support students with disabilities in writing. Word prediction software anticipates a student's intended words based on letter patterns and context, reducing the spelling and cognitive load required to generate text. Speech-to-text tools convert spoken language into written form, allowing students with fine motor challenges, dysgraphia, or expressive writing difficulties to capture their ideas more efficiently. Text-to-speech tools read student writing aloud, helping students identify errors, improve sentence clarity, and engage in self-editing, particularly valuable for students who struggle with reading their own work. Grammar and spelling support flag errors in real time, providing immediate feedback that facilitates learning rather than delaying it until teacher review. Graphic organizers and digital outlining tools help students plan, sequence, and structure their ideas, supporting executive functioning and organization throughout the writing process. Collectively, these tools have played an essential role in helping students with disabilities participate in writing tasks that might otherwise be inaccessible.

As access to one-to-one devices has increased and the cost of educational software has decreased, tools that once required extensive assessment processes and specialized personnel are now readily available in general and special education classrooms (Goldman, Carreon, & Smith, 2024). For many teachers, these tools have become routine instructional supports rather than specialized accommodations, benefiting a wide range of learners beyond those with identified disabilities.

RESPONSIBLE AI USAGE

What has changed more recently is the rapid advancement of generative AI. These newer tools have expanded what is possible by supporting students across multiple stages of the writing process, including brainstorming, drafting, revising, and receiving feedback. At the same time, they have sparked understandable concerns among educators. Questions about cheating, overreliance, and the impact on critical thinking have placed writing at the center of ongoing debates about AI in education.

While these concerns deserve attention, focusing exclusively on risks ignores a key truth: when integrated into effective instruction, AI-powered tools can extend the legacy of assistive

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technology and further dismantle barriers for struggling writers. Rather than representing a sudden or radical shift, generative AI should be viewed as an extension of the same goal that has guided AT use for decades: to provide students with meaningful access to learning and opportunities to express what they know.

Despite growing interest, many educators continue to approach AI with understandable caution, especially in writing instruction. Concerns about students using AI to generate entire essays, bypass the writing process, or undermine the development of critical thinking skills are common and valid. Writing has long been viewed as a core academic skill, and teachers rightly worry about tools that could short-circuit the effort, persistence, and problem-solving that writing requires.

At the same time, focusing exclusively on the risk of misuse can limit an equally important reality, that many students, including those with disabilities, already face significant barriers that prevent them from fully engaging in the writing process. When used intentionally, AI-supported tools can help remove these barriers without replacing instruction or diminishing expectations. Just as earlier AT tools allowed students to bypass mechanical challenges while still engaging in meaningful writing, newer AI tools can support planning, language generation, organization, and revision in ways that keep students actively involved in their work.

It is vital to appreciate that these supports are not limited to students with identified disabilities. When thoughtfully integrated into instruction, AI tools can benefit a wide range of learners by providing scaffolds, feedback, and multiple entry points into writing tasks. The instructional challenge, then, is not whether AI should be used, but how it can be used responsibly. This would include clear expectations, guided practice, and teacher oversight to support learning rather than replace it. When framed this way, AI becomes less about cheating and more about access, engagement, and supporting students in becoming more capable and confident writers.

A brief note on the ethical and responsible use of AI in education is warranted. As with any educational technology, teachers should review their district's technology guidelines and each tool's privacy and use policies before classroom implementation. The tools and examples highlighted in this article are designed to support instruction through intentional teacher guidance and student-teacher interaction. AI tools cannot replace instruction; they are at their best when paired with active teaching, providing a scaffold for learning rather than a substitute for it.

ALIGNING AI-SUPPORTED TOOLS WITH WRITING INSTRUCTION DECISION-MAKING

Given the complexity of writing and the diverse needs of students with disabilities, effective writing instruction requires more than a single strategy or tool. For many students, writing difficulties are directly connected to IEP-identified needs such as language development, written expression, executive functioning, or access to grade-level content. Addressing these needs requires specially designed instruction (SDI) that intentionally targets barriers within the writing process while maintaining high expectations for student learning.

The remainder of this article is organized around the stages of the writing process commonly used in classroom instruction and reflected in IEP goals, instructional planning, and MTSS frameworks. Students may experience breakdowns at different points in this process, including when activating background knowledge, generating ideas, organizing information, drafting text, or revising and editing their work. By aligning AI-supported tools to specific stages of writing, classroom teachers can more precisely match supports to student needs rather than relying on broad, one-size-fits-all accommodations.

Within each of the following sections, examples are provided to illustrate how AI-supported tools can function as part of SDI, Tier 2 or Tier 3 interventions, or universally designed classroom supports. These tools are presented as ways to reduce barriers related to the writing process, including language, organization, transcription, and self-monitoring, allowing students to demonstrate their knowledge and skills. When used intentionally, AI-supported tools can help student progress toward IEP goals, inform instructional decisions through formative feedback, and increase student engagement in writing tasks across instructional settings.

This article does not seek to argue that AI is a replacement for instruction or assessment. Instead, it reinforces the teacher's role in selecting, modeling, and monitoring tools based on student data and instructional goals. By embedding AI supports into the writing process, educators can better align technology use with evidence-based writing practices, MTSS problem-solving, and ongoing progress monitoring, ensuring supports remain responsive, purposeful, and instructionally sound.

ACTIVATING BACKGROUND KNOWLEDGE

Starting as early as fourth grade, there is a shift from learning to writing to writing to learn. Students frequently draw on class materials or their own research to formulate arguments and document their work. Oftentimes, literary analyses and other writing tasks require students to cite source texts. There lies another challenge for many struggling writers. Because struggling writers are often struggling readers (Bone & Bouck, 2017), the decoding and comprehension skills required to activate background knowledge add another level of complexity and challenge. For teachers, AI tools enable them to present the same material in multiple formats and at various levels. For students, these tools provide independence and empower them as learners.

Content area writing requires the use of textual evidence. Diffit (https://web.diffit.me/), for instance, repurposes and automatically differentiates YouTube videos, PDFs, and more. Teach-

ers simply upload their original source and let Diffit do the rest. It can create summaries of videos at a chosen reading level, grab images from the internet that relate to the content, and even create graphic organizers and vocabulary lists tailored to the uploaded content. Once created, these can be shared with students via PDF or through the Google or Microsoft Suite.

Whereas Diffit repurposes content into worksheets, NotebookLM (https://notebooklm.google/) transforms static content into multimedia material. Teachers can upload course-specific content (e.g., PDFs, videos, text) to the platform to instantly generate custom podcasts, mind maps, study guides, and videos based exclusively on the uploaded material. The podcasts generated sound surprisingly real. An added feature is that students can "join" the podcast and interact with the hosts, asking clarifying questions or steering the conversation. The videos are narrated slideshows, where the images, text, and voices are all generated by the AI. Each of these resources can be shared with students (and parents) to use before and during the writing process.

BRAINSTORMING AND PLANNING

The initial writing phase, which involves brainstorming and planning using traditional methods such as mind mapping and outlining, is designed to help students focus on the topic and generate foundational ideas. When embedding AI tools into this stage, it is imperative to consider the assignment's type and purpose. AI tools are particularly useful for informative writing because they can rapidly generate factual content, similar to what a student might find in a textbook. However, students must be taught to confirm the validity of all AI-generated information. For example, a tool that generates a mind map of the events leading to World War I is not creating new knowledge; it is presenting existing, public-domain facts. Therefore, it remains essential for the student to cross-reference and confirm these generated ideas by finding relevant citations within their assigned course materials.

Aha Apple (https://www.ahaapple.com/) specializes in solving the "blank page" problem by assisting secondary students with topic selection and question development. The "Question Storm" tool helps students refine essay prompts into clear, specific writing questions. With the "Get New Ideas" function, students input their research subject, and the AI immediately generates a list of focused approaches. From there, the tool offers additional support, allowing users to ask the AI to evaluate an idea, provide research, or generate images (premium feature).

IdeaMap (https://ideamap.ai/) is a generative mind-mapping tool. Best used either in small groups or one-on-one with a teacher, students use this tool by typing in their informative essay prompt into the "describe your challenge" search bar. After clicking the "brainstorm" button, IdeaMap begins creating a complex, and slightly overwhelming, color-coded mind map. There are several options for simplifying the map. First, a teacher can zoom in on a specific component of the map.

YouTube Video - Aha Apple
https://www.youtube.com/watch?v=ZSl0BzOIcmk

YouTube Video - Idea Map
https://www.youtube.com/watch?v=lkEa1r_7A-4

Additionally, ideas can be folded or hidden by clicking the three dots under a rectangle and selecting "fold". Maps can be further personalized by adding arms, attaching notes (e.g., videos, links, textbook pages), and even uploading related files. Further, IdeaMap allows users to change the complexity of the text in each rectangle by clicking the magic wand and asking the AI to simplify the language.

Several other tools also provide mind mapping support. Mind Map Wizards (https://mindmapwizard.com/), for instance, uses AI to generate simplified, organized maps based on either a topic entered in the search bar or the content extracted from an uploaded PDF. Ember.ly (https://ember.ly/app/home) mcreates the simplest mind maps, often breaking ideas into short, one- or two-word branches. This makes them an excellent starting point, encouraging students to expand and develop the initial concepts with their own detailed ideas, while providing scaffolding to bypass the "blank page" problem many writers experience.

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DRAFTING

Much of the controversy around AI and writing revolves around the drafting stage. The purpose of drafting is to generate ideas into coherent, well-organized paragraphs. While generative AI can generate entire essays, using it in this way prevents the student from fully participating in the drafting process. The purpose of the tools in this article is to empower students to grow as writers by supporting skill development, not to encourage them to offload challenging tasks entirely onto AI.

Speech recognition tools such as Google Voice Typing and Microsoft Dictate have been used to support students with fine motor challenges or those who do better sharing their ideas out loud than using paper for decades. As generative AI becomes more advanced, so do speech recognition tools. Rather than simply transcribing the student's words, tools like AdutorAI (https://www.adutorai.com/) and Audiopen (https://audiopen.ai/) provide extra supports by cleaning up language (removing ums), summarizing, restyling, and even translating.

EDITING, REVISING, AND PROVIDING FEEDBACK ON WRITING

The process of editing and revising can be trying for struggling writers. Key to self-editing is the ability to analyze one's own work for grammatical and mechanical errors and awkward sentences. Oftentimes, however, students who struggle with writing also struggle with reading. Tools such as text-to-speech can help students hear their work. Other, more powerful AI tools can provide more advanced supports. Wonder AI (https://www.getwonderai.com/), Text Buddy (https://textbuddy.com/ai-writing-assistant), and Pro Writing Aid (https://app.prowritingaid.com/) identify grammar and spelling errors. Beyond basic editing, they can elevate the quality of the writing by focusing on style, tone, conciseness, and precision, through rephrasing, vocabulary suggestions, and sentence adjustments.

For teachers, providing high-quality feedback is a time-consuming yet necessary task. With EditGPT (https://editgpt.app/dashboard), the AI edits writing using track changes. Editing options include proofreading, streamlining content, changing the style, and increasing conciseness. After teachers process drafts using EditGPT, the immediately apparent needs in student writing can be addressed during one-on-one conferences or small-group interventions.

In addition to tools that support the traditional editing cycle, generative AI can also provide feedback on student writing in relation to the prompt. One example is MagicSchool.AI's (https://magicschool.ai/) Magic Student Writing Feedback tool. To create this personalized tool, teachers give it a name and description and select the student's grade level. They can add a description of the assignment, describe or upload a rubric for scoring the writing, and even upload the assignment. Then, they share the join code with their class or add it to their Google Classroom. Students then interact with the Magic School chatbot to receive immediate feedback on their writing.

Similarly, Snorkl's (https://teacher.snorkl.app/home) Writing Tool also provides feedback on student writing. Access the tool by clicking "create an activity". Give the activity a title and select "writing" as the student response type. Next, enter the writing prompt to which your students will respond. There is also an option to upload and attach source material to the assignment. Once the initial assignment information is entered, the teacher generates the AI feedback settings. Options for this include selecting the subject, grade level, and answer criteria (or rubric). Once you hit "assign", a URL is generated that can be shared with students.

More specifically, improving writing outcomes for students with learning disabilities is the Office of Special Education Programs' (OSEP) funded Project AI SCORE (https://projectaiscore.org/). This AI-powered tool delivers immediate, meaningful, and actionable insights on content, organization, and style to both students and educators. Developed by writing experts, Project AI SCORE utilizes a library of over 100 content-neutral informative writing prompts, all scaled to a third-grade reading level. By mitigating the confounding factors of reading level and background knowledge, the tool directly assesses a student's compositional ability, rather than their reading or content knowledge. Students log in, receive an informative writing prompt, and then proceed through a process that includes one minute for planning and nine minutes for writing. OSCAR, their On-Screen Composition Assistant for wRiting chatbot, provides just-in-time supports, such as sentence starters and guiding questions, throughout the nine-minute writing period. After the nine-minute write, students can immediately review the AI-provided feedback. Educators also gain immediate access to these results via a data dashboard that tracks individual writing metrics and longitudinal progress. To get access to this tool, fill out this interest form (https://forms.office.com/r/xTb145tC3E).

YouTube Video - What is AI Score
https://www.youtube.com/watch?v=lkEa1r_7A-4

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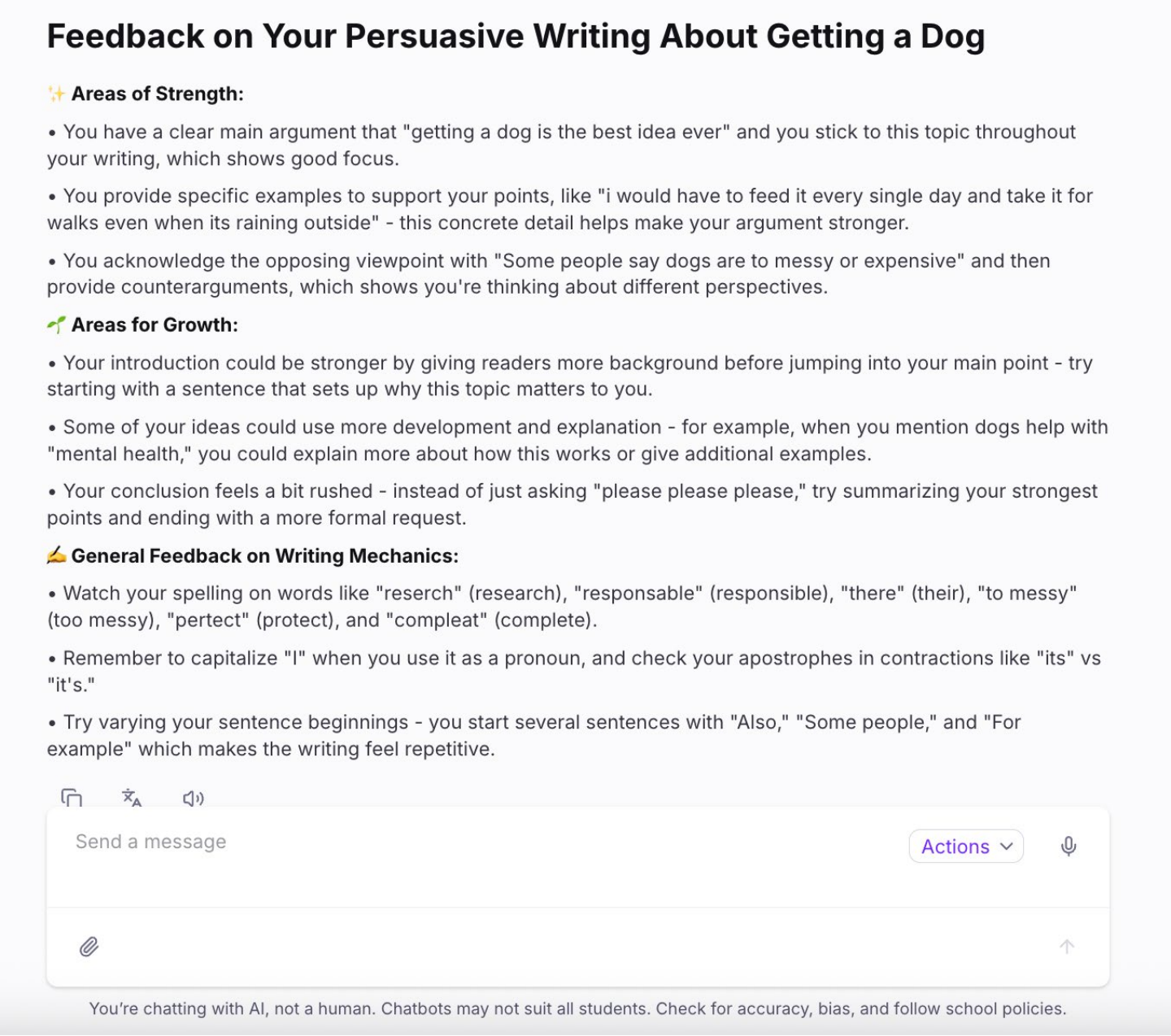

MagicSchool.AI - https://www.magicschool.ai/

INSTRUCTIONAL SUPPORTS TO IMPROVE WRITING

To improve writing outcomes, students need both practice and feedback. This includes formal writing opportunities (e.g., sustained writing, reports, and essays) and informal free-writing tasks. Through frequent writing progress-monitoring activities, such as Project AI SCORE, teachers receive formative feedback they can analyze to identify clear patterns of strength and need. This analysis, in turn, informs targeted instructional decisions and the resulting interventions that guide students to become better writers.

The Writing Classroom is a free, instructional website that provides middle- and high-school teachers with the tools to implement evidence- and research-based writing strategies. Recognizing that targeted intervention is key, the platform helps teachers quickly match specific student needs, whether it's developing ideas, strengthening structure, or refining sentence fluency, with proven strategies. The site offers instructional videos for both teachers and students, along with downloadable graphic organizers, organized intuitively by area of challenge, writing process stage, and rubric area. This organization allows teachers to use student writing data to drive precise intervention, focusing instruction exactly on what students need. To ensure interventions are effective and necessary, teachers must continuously monitor progress to determine whether the intervention is working, needs adjustment, or if the student is ready to move on. To ensure interventions remain effective and appro-

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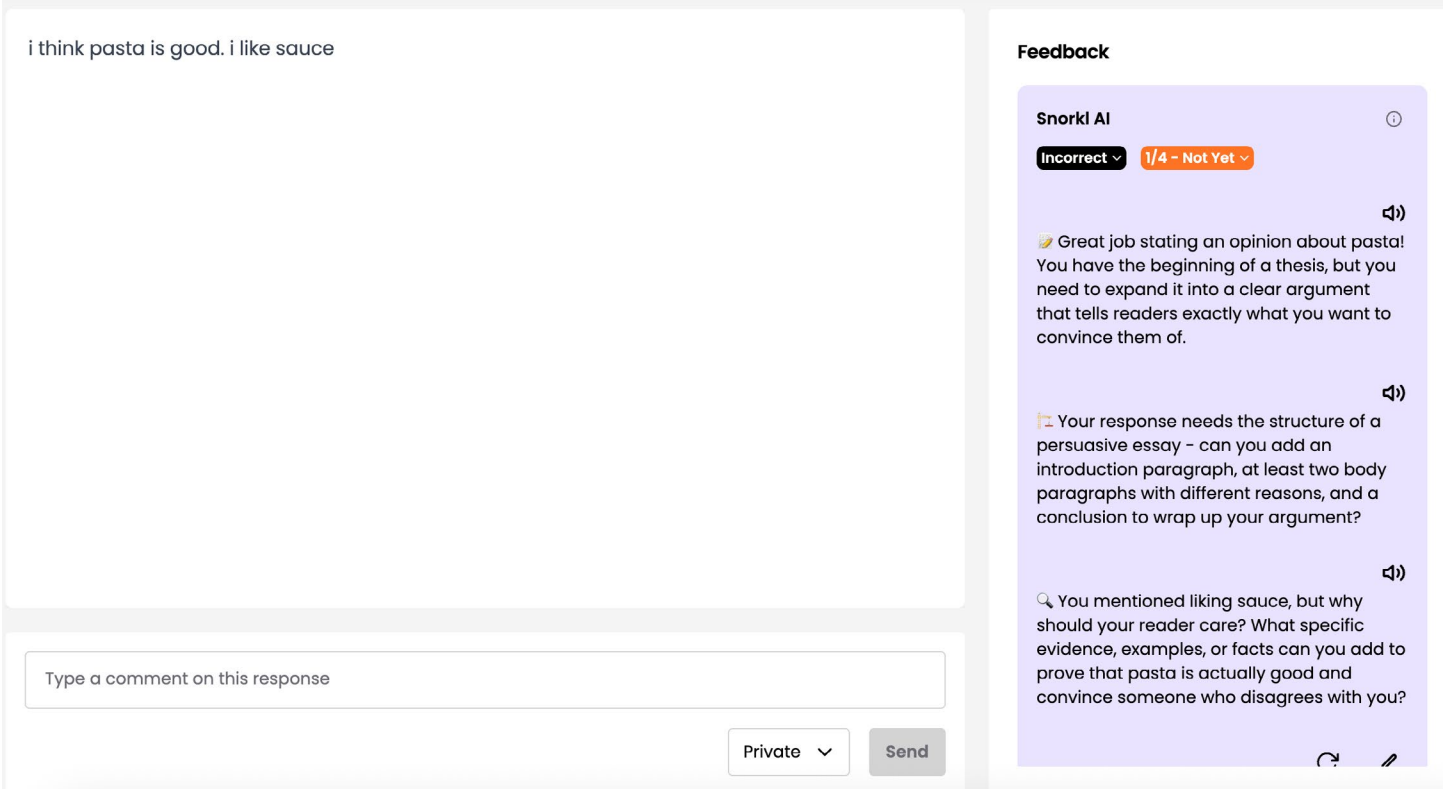
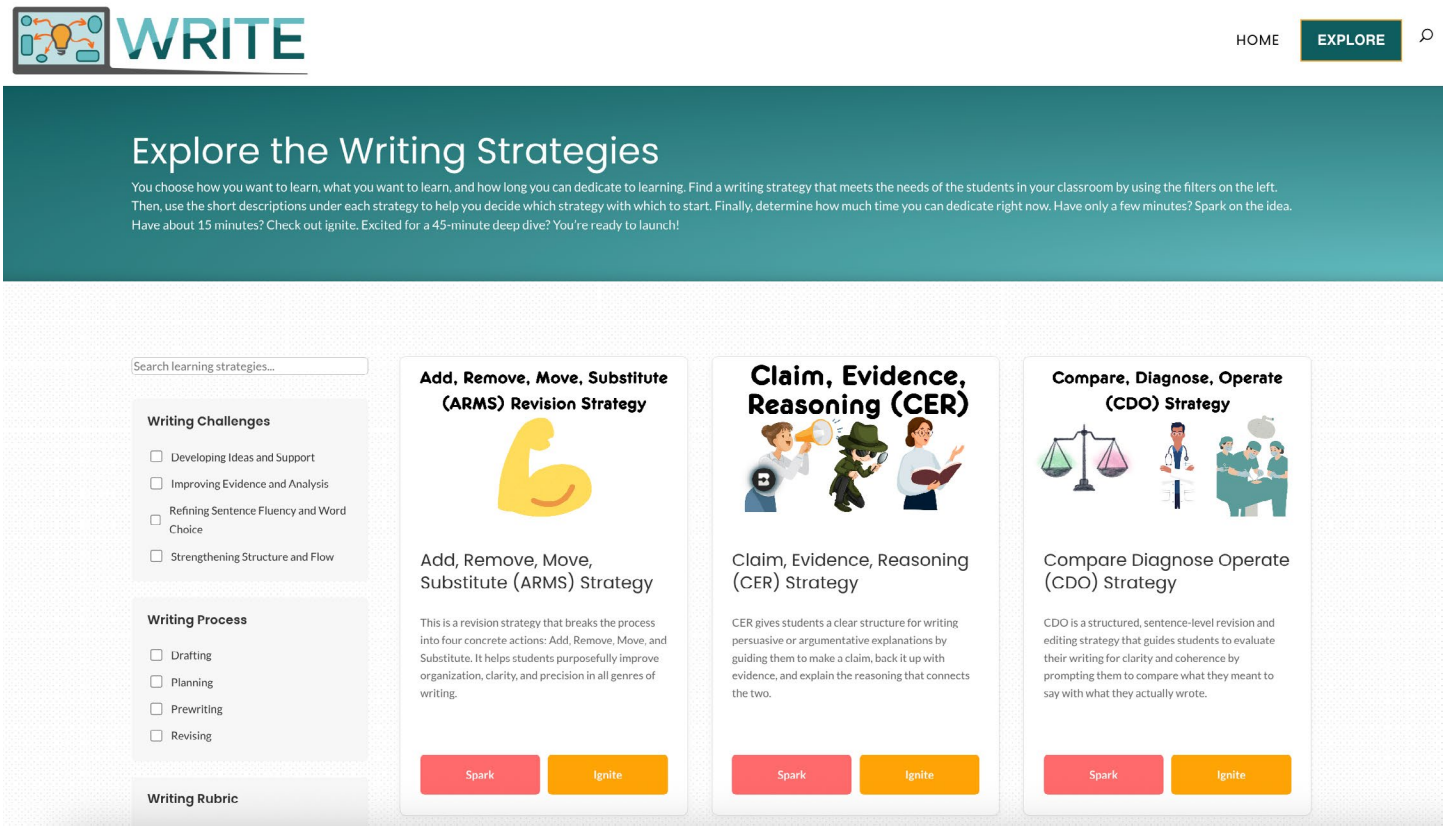


Snorkl - https://teacher.snorkl.app/



Writing Classroom - https://www.writingclassroom.org/

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priate, teachers should continuously monitor progress to gauge if the strategy is working, needs adjustment, or if the student is ready to move on.

Students benefit from continued practice to improve their writing skills. Thus, in addition to progress-monitoring activities and targeted small-group or one-on-one interventions with teachers, students need opportunities to practice their writing skills. In addition to formative and summative assessment data, No Red Ink provides comprehensive, scaffolded support throughout the writing process. Students receive personalized lessons and extra practice in key skills, such as identifying claims and restructuring sentences. Since the content automatically adjusts and provides supports as needed, students get the exact challenge and targeted practice they need, when they need it.

MOVING FORWARD: USING AI INTENTIONALLY TO SUPPORT WRITING

Writing is a foundational academic skill, yet it remains one of the most complex and demanding tasks students are asked to perform in school, especially for students with disabilities (Graham et al., 2017). As outlined throughout this article, students with disabilities often encounter barriers at multiple points in the writing process, from accessing background knowledge and generating ideas to organizing thoughts, drafting text, and revising their work. When these barriers go unaddressed, assignments often measure a student's disability rather than their understanding or learning.

As educators consider next steps, the most effective use of AI begins with the writing process itself. Rather than starting with a "cool" AI tool and searching for a use, teachers are encouraged, first, to identify where students struggle. It might begin by asking and answering questions like, "Do students have difficulty understanding source material?" Generating ideas? Organizing information? Sustaining writing during drafting? Revising and editing independently? By using formative assessments and IEP goals as a roadmap to answer these questions, AI selection becomes an intentional pedagogical choice, allowing teachers to target the specific barriers hindering a student's progress. Table 1 provides a reference list for teachers considering integrating AI-supported tools into their writing instruction.

Table 1

Practical Next Steps for Classroom Teachers

To begin or refine the use of AI-supported tools for writing, educators may consider the following steps:

1. **Start with student needs, not tools.**

Use writing data, IEP goals, and classroom observations to determine which stage of the writing process presents the most significant barrier for students.

2. **Align tools to the writing process.**

Select AI tools that support specific phases such as activating background knowledge, brainstorming and planning, drafting, revising, or providing feedback, rather than tools that attempt to do everything at once.

3. **Integrate AI as part of instruction.**

Model tool use, establish clear expectations, and embed AI supports within lessons, small-group instruction, or interventions, rather than assigning them as independent or unsupervised tasks.

4. **Monitor progress and adjust supports.**

Use student writing samples and AI-generated feedback to inform instructional decisions, adjust supports, and determine whether students are making progress toward writing goals.

5. **Maintain high expectations.**

AI tools should reduce barriers, not lower standards. When used effectively, they allow students to focus on higher-level thinking, communication, and engagement in the writing process.

CONCLUSION

Writing will continue to play a central role in how students demonstrate learning across content areas. For students with disabilities, meaningful access to writing requires intentional instructional design, appropriate supports, and ongoing progress monitoring. AI-supported tools, when used responsibly and thoughtfully, offer powerful opportunities to address long-standing barriers to writing while honoring the teacher's role as the instructional decision-maker.

Rather than viewing AI as a threat to writing instruction, educators are encouraged to view it as a resource that builds upon decades of AT innovations, aligns with IEP goals and MTSS frameworks, and supports students at the points where they struggle most. When AI is aligned with the writing process and grounded in effective instruction, it not only supports students with disabilities but also offers a means towards more inclusive, engaging, and effective writing instruction for all learners.

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Growing AT Capacity Together:
Empowering Students, Staff, and Families

Summary: Building assistive technology (AT) capacity isn't just about devices; it's about people, systems, and culture. I focus on creating sustainable, district-wide systems where staff, students, and families are trained, supported, and feel empowered. Using frameworks like QIAT and embedding AT through Universal Design for Learning, we normalize tools for all learners. Through hands-on professional development, student leadership, family engagement, and strong IEP documentation, we ensure every student has access, feels confident, and can thrive with the supports they need.

Building assistive technology (AT) capacity in a school district is not simply about purchasing more devices or keeping up with the newest apps. True capacity-building involves creating a sustainable system where assistive technology is understood, embedded, implemented, and supported across all buildings so students consistently have access to the tools they need to learn, communicate, and participate.

A strong district-wide AT model requires a shared vision, clear processes, meaningful professional development, and ongoing evaluation. Whether your district is just beginning its AT journey or has an established program, I hope to provide practical tips and strategies to support you in building AT capacity in your own district.

While our system is still a work in progress, it has been shaped and strengthened over the past 21 years through continuous reflection, collaboration, and a strong commitment to improvement. Each year, we continue refining our practices to better support staff, students, and families, and to ensure students receive consistent and effective AT services.

USING QIAT TO GUIDE CAPACITY-BUILDING

One of the most effective frameworks for guiding this work is the Quality Indicators for Assistive Technology (QIAT). These indicators provide districts with a roadmap for building systems around AT consideration, assessment, IEP documentation, implementation, evaluation, professional development, and administrative support.

Over 21 years ago, when I started building capacity with AT in our district, I gathered staff from across the district (our first Assistive Technology Committee) to go through each of the Quality Indicators and rate where we are. We then used the matrices to create our mission and goals for the district to increase implementation of AT tools and services. Click here for a link to the indicators and Matrices

We continue to revisit the indicators to ensure we are doing everything we need to build capacity by supporting our students with AT tools and supports.

KELLY KEY is the Assistive Technology Coordinator for the Barrington School District (EC-Transition) in Barrington, Illinois. She has worked in the field of special education for over 29 years. Kelly has been in her current role (Assistive Technology Coordinator) for 21 years. She has also served as an administrator for 13 years as a Special Services Facilitator and Assistant Principal. Prior to becoming an administrator, Kelly taught special education students with multiple needs for 9 years. She has a Bachelor's degree in Special Education, a Master's Degree in Early Childhood Special Education, and a Certificate of Advanced Study in Educational Leadership as well as an ATACP (Assistive Technology Applications Certificate). Kelly has also served as an adjunct instructor at the University of Illinois Chicago. Kelly presents at local, state, and national conferences and colleges on various assistive technology topics and she loves sharing what is working with her students to be able to help more students outside of her district.

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EMBEDDING AT THROUGH UNIVERSAL DESIGN FOR LEARNING (UDL)

Another essential component of building AT capacity is embedding AT within a Universal Design for Learning (UDL) framework. We do our best to ensure that all staff, students, and families are familiar with the universal tools available for all students and implement these into their planning process and teaching.

This benefits all learners. It reduces stigma and creates environments where accommodations are normalized, like everyday learning tools. Teaching these tools at a whole-class level also ensures students who need them for IEP accommodations feel confident and supported using them.

In our unit school district, we are fortunate to have 1:1 iPads for all students from Kindergarten through High School Transition. The built-in accessibility features are incredibly powerful and continue to improve with every update. We also provide universal access to tools such as Read&Write and OrbitNote for all staff and students.

For students who require these or other tools as an IEP or 504 accommodation, we use the SETT framework to ensure assistive technology decisions are individualized and based on student needs. This process includes teaching students how to use the tool(s), collecting data to determine effectiveness, and providing ongoing support to ensure successful implementation. (See the section on AT consideration below for more information).

Image 1: AT toolkit and sign out sheet.

Another universal support we have in all of our schools is our AT/OT Toolkits. These bins are filled with low and mid-tech items for all staff to check out and use with students. The OTs in each building help promote and maintain the toolkits. If staff would like to trial an item with a student, they sign out the item, trial it for a couple of weeks, and then return it to the toolbox. If the student had success with the tool, they purchase the item with their classroom or building budget.

Click here for a list of the AT/OT Toolkit items (See Image 1)

PROFESSIONAL DEVELOPMENT: THE ENGINE OF CAPACITY-BUILDING

Professional development (PD) is the engine that drives district-wide capacity. PD for staff, students, and families is imperative. Staff, students, and families need to not only be aware of what is available, but they also need to learn how to use the tools, learn the research behind how these tools can help support our students, the tasks they can support, and learn how they can seamlessly implement these into everyday practice.

The following are some of the most effective ways I provide professional development for staff, students, and families.

STAFF:

I used to travel to all 13 schools in our district to provide training at staff meetings, typically at least once each year. By the time I finished visiting every building, the school year was nearly over.

The message I provide to staff includes both the why and the how: why assistive technology matters, and how to realistically incorporate it into what they already do. The goal is to embed AT into their planning process, encourage teachers to use these tools while teaching, and ensure that students who have AT listed as an accommodation on their IEP not only have access to the tools but are supported in using them confidently and effectively. Staff play a key role in helping students implement AT successfully and feel comfortable using it in their daily learning.

These are eight ways I provide professional development now for our staff:

1. **New Educator Orientation:** All new certified staff members are required to attend new educator orientation the week before school starts. During this time, I lead a group session to provide assistive technology PD for all attendees. This is an excellent opportunity for staff to learn together about what AT is available across the district, become comfortable using the tools, and explore best practices for effective implementation.

2. **PD Through Videos:** Instead of waiting for me to visit each school, I have created pre-recorded videos for

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staff. The instructional coaches in each building share a mini video at each staff meeting, or take one staff meeting at the beginning of the year to show the full series, whatever works best for each school. This way, everyone gets the information at the beginning of every school year. I also create mini videos to share as needed throughout the school year. My rule of thumb is that if 3 or more people have asked you the same question, make a video and put it on your YouTube channel or in a shared Drive folder for all to access.

3. **Institute Days:** Before the school year begins, I get on the calendar to provide professional development during institute days. These sessions are a great chance to engage staff in learning together, whether it's for a specific group, an entire school, or district-wide. It's a hands-on way to explore the tools, share best practices, and get everyone feeling confident using AT. (See Image 2).

4. **Summer Professional Development:** I provide professional development sessions as part of our district's summer university program. These sessions are a fun and interactive way for staff to explore AT tools, deepen their understanding, and practice strategies in a relaxed, collaborative setting. It's also a great opportunity to connect with colleagues, share ideas, and get inspired for the year ahead!

5. **Meet with Special Services Teams:** I meet with each special services team from each school at the beginning of the year. These meetings ensure that students who have AT listed as an IEP accommodation are not only getting the tools they need, but are also using them confidently and effectively. I also take the time to talk through how to document AT in the IEP and discuss AT consideration for individual students, so everyone is on the same page and ready to support successful implementation.

6. **Round Robin Style Training:** Providing round-robin style training sessions during the school day is one of my favorite ways to offer mini PD without needing substitutes. Staff can sign up for a session at a time that works best for them, whether it's during their planning period, lunch, or another free moment. I bring the training right to them, either just outside the classroom door or in a convenient common space like the teachers' lounge. Each session covers the same content, so everyone gets the full benefit at a time that fits their schedule.

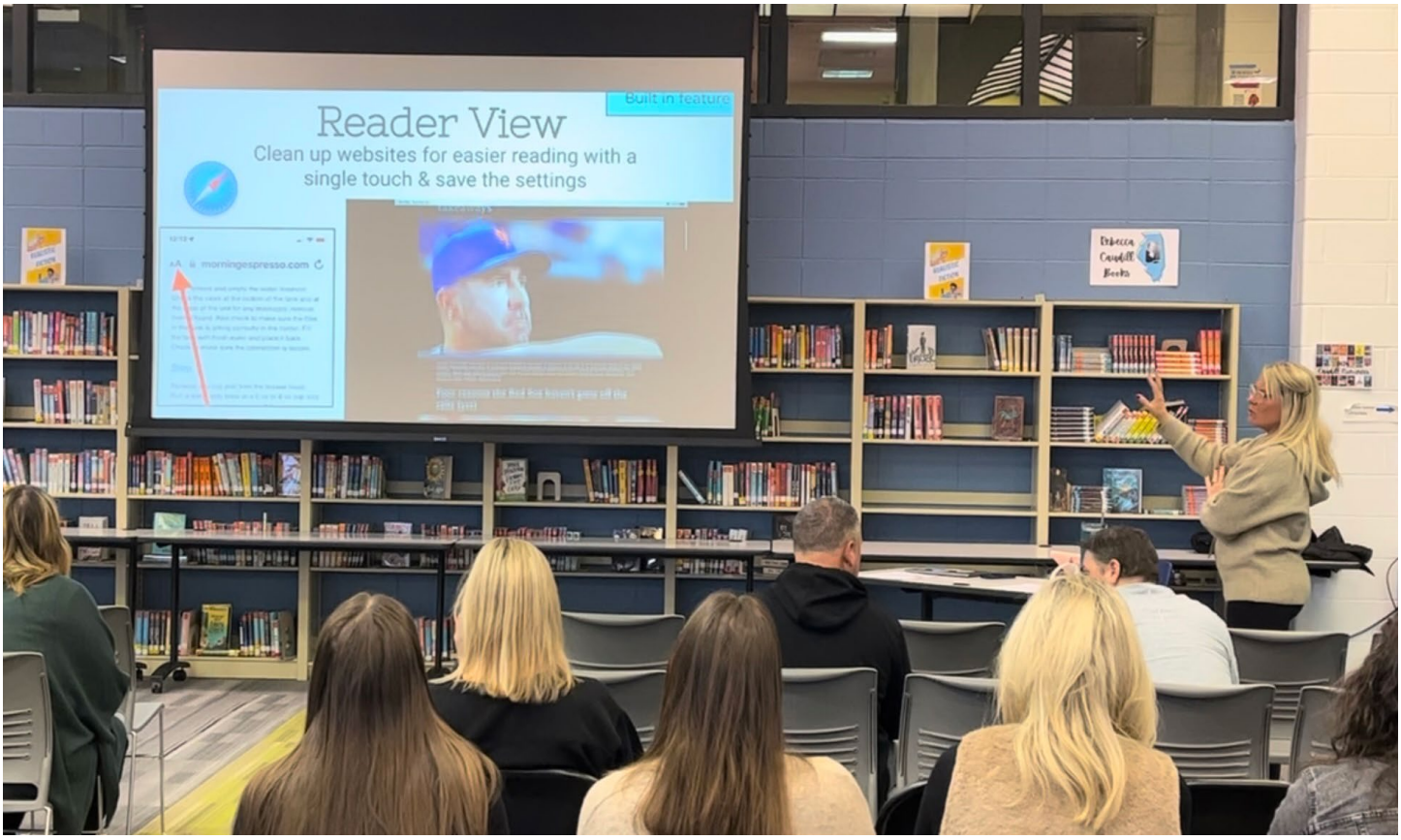

Image 2: Kelly presenting to staff during an institute day.

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7. **Regularly Scheduled Group Meetings:** Throughout the year, I regularly join different teams during their monthly meetings, whether it's instructional coaches, assistant principals, OTs/PTs, teacher groups, the tech department, and more. These sessions are collaborative and hands-on, giving me the chance to tailor PD to each group's specialty, troubleshoot challenges together, and celebrate successes along the way.

8. **Write for Newsletters and Blogs:** I've found that a monthly AT newsletter created in Google Slides is a total game-changer for delivering small, manageable snippets of PD. I maintain a single slide deck for the entire year, and each month I add a new slide focused on a specific AT topic. Each slide includes a link to a short video (with a secret password!) and a link to a Google form. After watching the video, staff fill out the form with their name, school, AT implementation goal for the month, and the password from the video. At the end of the month, I pull names for small prizes, making learning fun, interactive, and easy to implement! I also make it a point to share AT tips and strategies through any newsletter I can contribute to. Some of the newsletters I regularly write for include school newsletters, the monthly tech blog, our special services newsletter, the high school staff newsletter, and more, spreading ideas and inspiration to as many staff, students, and families as possible!

Regardless of how and when you fit in the PD, it is important to also share that it is not just capacity building, it's the law: IDEA 34 CFR 300.39 (b) (3) (ii) shares that "No single service or individual is solely responsible for the progress and development of any particular skill area (Hernandez, 2023). Sharing this on a slide during your next staff PD could be a valuable addition.

STUDENTS:

Building AT capacity isn't just about giving students access to tools; it's about helping them feel confident and capable while using them. When students understand why a tool is helpful and how it can support their learning, they're much more likely to use it consistently, independently, and with a sense of ownership. This is especially important for students who have AT listed as an IEP accommodation: when peers are trained on and familiar with the tools, these students are far more likely to use them successfully, feel included, and know that using AT is just a normal part of learning, not something that makes them stand out.

Five ways I support student learning include:

1. **Classroom Training:** I love training full classes on AT tools! Together, we explore how the tools work, try them out on real assignments, and troubleshoot along the way. It's hands-on, interactive, and a great way for students to build confidence while learning in a supportive environment. This is also a great way to normalize the technology, everyone has it available, everyone has been trained on it, so the students who need to use this as an accommodation, feel more comfortable with using it. (See Image 3)

2. **Student Leaders:** I empower students who are already using AT tools to become classroom "experts." These students help their peers, answer questions, and model how to use the tools confidently, turning them into leaders and advocates in their own classrooms. (See Image 4)

Image 3: Kelly providing training on universal tools to a full class of students.

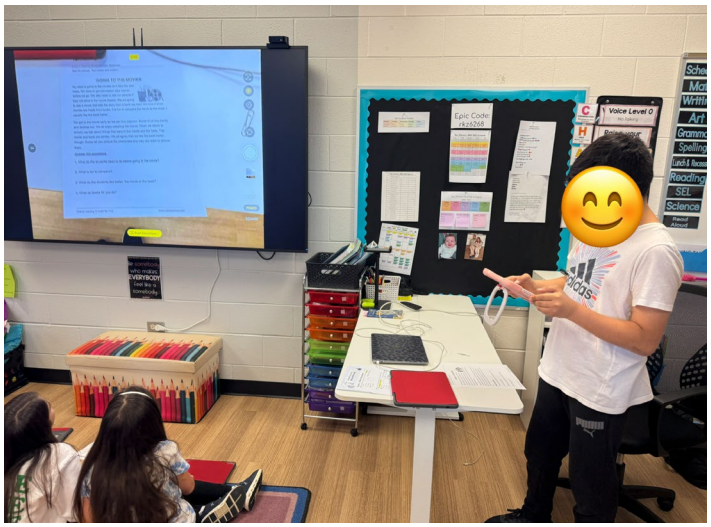

Image 4: Student training his full class on universal tools to support reading and writing.

3. **Teacher & Staff Empowerment:** I coach teachers and special services staff to train full classes or small groups of students, ensuring that AT support and learning continue seamlessly throughout the school day. This helps students gain confidence, use their tools naturally, and feel fully included in the learning process.

4. **Push-In Support:** I regularly push into classrooms to support AT implementation in real time, coaching students and helping staff use the tools effectively. I also encourage related services staff to do the same, creating a collaborative, hands-on learning environment.

5. **Middle School Videos:** The first week of school each year, all 6th, 7th, and 8th graders receive interactive video training during study hall, using interactive videos I created. The students set the tools up and try them out with the guidance I provide through the videos. The best part is that staff learn alongside their students! These videos are shared across all buildings for staff to play for their students to encourage consistent, school-wide use of AT tools.

FAMILIES

Families are a key part of building AT capacity, it is important for them to understand the tools their children are using at school. This way, they can reinforce learning at home, boost confidence, and help their children become more independent.

Here's 7 ways I like to involve families:

1. **Back-to-School Night:** During our back to school night, I provide a slide for teachers to share about AT, giving families a quick, introduction to the tools their children have available to them. It's a great way to start off the year!

2. **Board Presentations:** At times, I get the opportunity to present at board meetings to celebrate AT successes, share ideas, and show how families can support their child's learning. This is a great opportunity not only for families and community members, but also for district leaders to learn more about AT and how it can support our students.

3. **Parent Meetings:** I host PD during parent gatherings, like parent task force meetings or PTO events, so parents can ask questions, share experiences, and learn strategies together.

4. **Student-Led Demonstrations:** I encourage students to show their parents how they use AT tools, giving families a first-hand look at their child's learning and celebrating their successes together.

Image 5: AAC Family Fun Night Game Station.

5. **Parent AT Groups:** Hosting parent AT groups during the school day has been amazing. Parents connect, share tips, and support one another in helping their children use AT confidently at home. I will host these meetings based on the tools their child uses (ie: Speech Recognition parent group). The tips that families share with one another are sometimes beyond what I can provide since they can relate with one another.

6. **AAC Family Fun Nights:** These events are all about family engagement! Families can bring anyone they like; siblings, family members, outside providers, and caregivers. We start the night out by providing tips to the full group, and then we break into stations of activities (ie: game, toy, shared reading, etc). We provide coaching on AAC implementation while participating in the fun activities, and then the families take the activity home to continue practicing together and having fun. It's hands-on, interactive, and a great way to make AAC implementation fun! (See Image 5)

7. **Virtual Parent Networking Group:** This is a virtual space where parents and professionals partner together. Families can collaborate, share strategies, ask questions, and learn from one another in a structured setting, all from the comfort of home. It's a supportive community where parents can ask and answer one another's questions while strengthening AAC implementation at home.

AT CONSIDERATION FOR INDIVIDUAL STUDENTS

Building AT capacity also means having strong systems in place for consultation and individualized support, especially for students who require assistive technology as part of an IEP or 504 plan. In our district, we've found that having clear,

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consistent procedures helps ensure every student's AT needs are thoughtfully considered and effectively implemented.

This process includes:

- **Staff and Parent Input Forms:** I developed information gathering forms based on Joy Zabala's SETT framework to gather detailed information from school teams and families before meeting with the student. This helps us start the process with a strong understanding of the student's strengths, needs, current supports, and daily demands across environments.

- **Structured Sessions with Students:** I schedule several structured sessions with each student, and I always have another staff member present. This not only supports students' comfort level but also strengthens follow-through and implementation once tools are introduced. I typically begin our first session by getting to know the student, asking what they feel they need support with, what tools they are already using, what's working, and what they might want to try. Throughout the sessions, I explicitly teach the student how to use the tools. This step is essential and must happen before collecting any data on effectiveness. Often, one of our final sessions includes the student's parents. During this time, the student shares and demonstrates the use of the tools they use and what types of assignments or tasks they support. (See Image 6)

- **Classroom Observations & Implementation:** Observing students in the classroom environment is a key part of the process. It allows me to see real-life demands, identify barriers, and ensure the tool can realistically be used within daily routines and expectations. Providing hands-on support as needed throughout the lessons is a valuable way to support implementation.

- **AT Summary Documentation:** Once data is collected and the tool(s) have been determined effective, the IEP or 504 is amended to clearly document the tools and the specific tasks they support.

To support carryover, I also provide staff, families, and students with a quick reference card that lists the tool(s), the task(s) it supports, and how it should be used. I include links and QR codes to training videos as well, so implementation support is always easy to access. I also provide a quick card for the student to reference as needed. A mini version is often taped to the student's desk or their iPad for quick reference. (See Image 7)

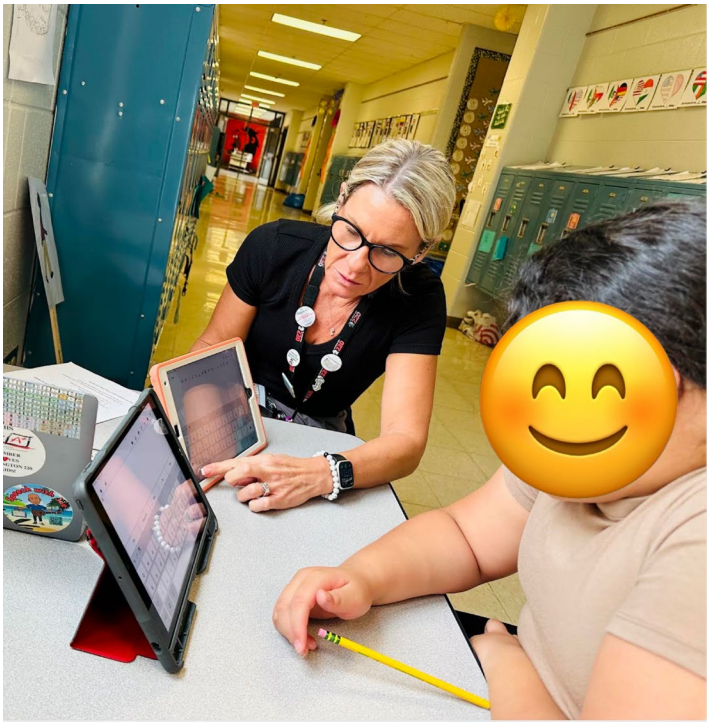

Image 6: Kelly working with a student and a resource teacher.

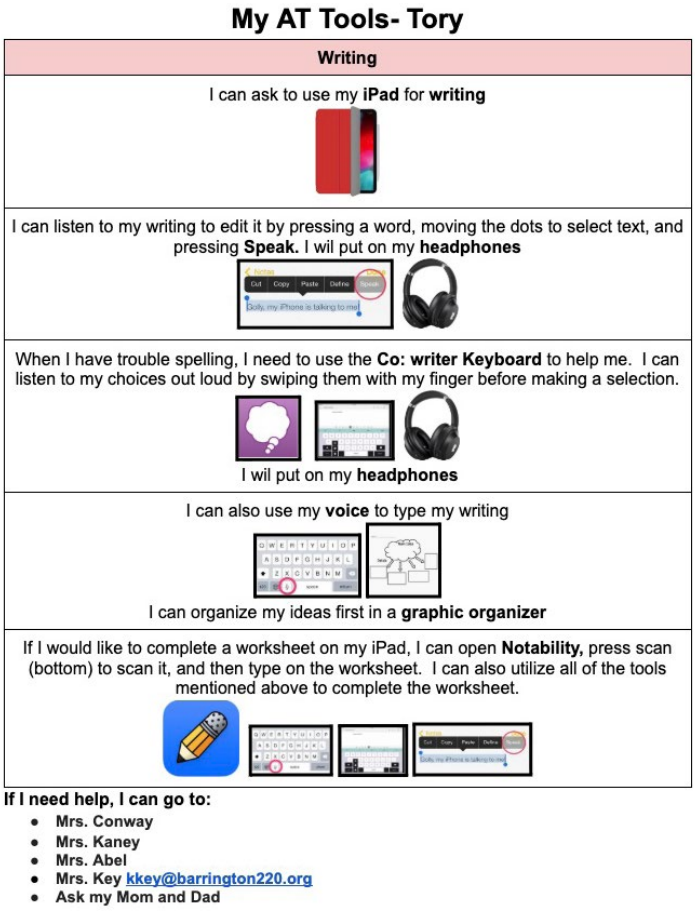

Image 7: Example of student AT quick card.

FINAL THOUGHTS: CAPACITY-BUILDING IS ABOUT PEOPLE

At the heart of building AT capacity is people, not products. I truly believe it takes:

- Administrators who prioritize access and training
- Staff who feel empowered and confident
- Students who are trained, capable, and comfortable using their tools
- Families who understand and support AT implementation

When we commit to structured frameworks like QIAT, embed universal tools through UDL, create clear consultation and IEP processes, and provide ongoing professional development, AT becomes not just available, but sustainable, meaningful, and effective.

We are always looking for additional ways to strengthen capacity across the district, and I am grateful to play a role in supporting that growth every day.

If you have any questions or would like more information about anything I provided, please don't hesitate to reach out! You can email me at kkey@barrington220.org ■

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Mobility and Speech Disabilities:
Digital Solutions in Practice

Summary: This article will demonstrate how integrated assistive technology (AT) solutions enable professional independence for individuals with mobility and speech disabilities. Esther Klang will share her customized digital workflow, illustrating practical approaches to computer access, remote communication, and creative expression. Readers will explore her tool selection process across head tracking, adaptive mice, Augmentative and Alternative Communication (AAC) applications, and content creation platforms. The article will provide AT professionals with real-world insights into comprehensive technology integration, addressing both daily functionality and long-term sustainability considerations for users navigating complex communication needs.

THE DAILY REALITY

Every morning, Esther Klang begins her workday like millions of others: checking emails, responding to messages, and creating content. The difference? She accomplishes all of this without using traditional speech or manual inputs. Her thoughtfully self-selected toolkit of technologies enables her to independently and efficiently manage all her daily digital activities.

It hasn't always been that way. Esther spent many hours learning and testing assistive technology (AT) on her own to determine the best setup for her needs. Months without communication or computer access during multiple hospitalizations left her trapped in silence, an experience that drives her advocacy efforts and work to prevent others from facing the isolation she endured.

Now, she advocates and educates society internationally to ensure that people who experience mobility and speech disabilities get comprehensive access without facing the isolation she experienced. As she often says, "People who are not vocal can accomplish anything they want. Being non-vocal does not mean being non-verbal, uneducated, or unable to achieve professional and personal success. They can achieve greatness, happiness, and contentment in their personal and professional life."

Esther's story illustrates how thoughtful technology choices enable real independence and participation. Her advocacy highlights the necessity of understanding the principles behind AT, which empower individuals to make informed decisions about their own tools. Building on this perspective, the

ESTHER KLANG is a user experience expert and accessibility tester who holds the Certified Professional in Accessibility Core Competencies (CPACC) certification from the International Association of Accessibility Professionals. She provides digital accessibility testing and user-informed feedback for multiple organizations, including WINS, with a focus on real-world usability and inclusive design. Her work centers on disabled users as subject-matter experts, helping teams identify barriers that automated tools alone often miss. She regularly shares her insights through online writing and community education. Esther advocates internationally for improved access to assistive technology and augmentative and alternative communication systems that support genuine independence.

TIFFANY WILSON brings over 15 years of experience to assistive technology program management and accessibility consulting, specializing in distance communication solutions and digital equity. She presents internationally on complex AT integration and secure access. Tiffany has directed and advised AT initiatives nationwide, collaborating with disability advocates to expand access to communication technology across the United States. She founded Wilson Inclusive Solutions (WINS) to mobilize handpicked accessibility experts for projects requiring specialized technical knowledge in order to assist organizations and advance accessibility together.

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Esther's Intro Video Link - https://video.gumlet.io/6757541663a847265464088b/675761e6d60f7be9e27c0c13/download.mp4

following section explores the foundation of AT and its diverse applications, laying the groundwork for a more detailed look at the specific tools and strategies that Esther has selected to maintain her autonomy.

FOUNDATION

Assistive technology refers to any item, piece of equipment, or product system that aids individuals by increasing, maintaining, or improving their functional independence (1).

Like standard technology, AT is categorized by functionality across basic, intermediate, and advanced levels, each serving unique purposes. For individuals managing complex communication needs, integrating solutions across this spectrum is essential for comprehensive access. This continuum ranges from:

- **Low-tech:** typically inexpensive and straightforward, such as communication boards and mouth sticks.
- **Mid-tech:** includes moderately complex tools like voice amplifiers and portable communication devices.
- **High-tech:** representing the most advanced solutions, such as eye-gaze systems and sophisticated speech-generating devices.

COMPUTER ACCESS: ESTHER'S SOLUTIONS

AT can be grouped into ten domains (2), with each category addressing specific challenges and providing targeted support. For Esther, the Computer Access domain became especially central to her daily activities, where the tools she chose allow independent interaction with computers, tablets, and smartphones. For individuals with mobility and speech disabilities, alternatives to traditional keyboards, mice, and voice commands are often necessary. Options can include head or eye tracking systems, adaptive input devices, keyboard shortcuts, and switch-based controls.

HEAD TRACKING

Challenge: Esther has quadriplegia and a speech disability. She relies on typing for communication due to speech difficulties stemming from shallow breathing, tracheostomy, and vocal cord paralysis. Traditional input methods do not work for her.

Esther's Solution: Head tracking systems translate head movements into full cursor control, enabling all mouse functions through natural head motions.

Esther's Experience: She uses Sesame Enable like a traditional mouse, moving the cursor with head movements and clicking to

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access on-screen keyboards. This technology allows her to type emails, text messages, social media, and website content. This is essential for her communication, as verbal expression can be challenging.

Alternative: Even though Sesame ceased operations in late 2019 and is no longer actively supported, the software remains available for download and use. However, users should be aware that compatibility and functionality may be limited as devices and operating systems evolve.

Esther is exploring SensePilot as an alternative head tracking solution, seeking similar functionality with a familiar, reliable webcam-based interface across devices.

What She Values: The ability to type efficiently through head movements because typing serves as her primary communication method. Head tracking must work consistently and effectively throughout long days of professional communication and content creation.

Limitations: The discontinuation of Sesame Enable required users to transition to alternative solutions and adapt to new systems. Additionally, camera-dependent setups may limit the ability to capture photos or video simultaneously.

Cost: Sesame Enable was originally subscription-based and is now free to download, though the company no longer provides support following its closure. SensePilot offers both subscription-based and one-time purchase options. Contact the company directly for current pricing details.

ADAPTIVE MICE (INPUT DEVICES)

Challenge: Head tracking systems use the device's camera, making photography and video recording impossible; the same camera cannot track movements and capture images simultaneously.

Esther's Solution: Augmental's MouthPad^, custom-fitted mouth interface with a built-in touchpad connecting via Bluetooth.

Esther's Experience: The MouthPad^ solved her photography limitation while providing computer access through subtle tongue and head movements. Setup proved quick and uncomplicated for her and caregivers, with Bluetooth connectivity eliminating cable concerns. The custom fitting is comfortable during extended use. Esther likes being able to drink water without needing to remove it.

Breakthrough moment: Learning to use camera apps independently was empowering for Esther, giving her the ability to take pictures and record videos on her own for the

Sesame Enable Video Link - https://video.gumlet.io/6757541663a847265464088b/67983b359f5a45b023af56eb/download.mp4

first time, and providing a new level of personal autonomy and satisfaction.

What She Values: Independent photo and video creation tops her list, plus reduced fatigue compared to other access methods. The mouth interface enables her to fully express her creativity and participate in social media, something she previously could not access.

Considerations: MouthPad^ works across smartphones, tablets, and computers with a consistent interface, but requires a custom-fitting process and caregiver assistance for initial setup.

Cost: MouthPad^ is available in the United States for $1,400, excluding the required dental scan. A two-device bundle is offered at $1,900 with promo code BUNDLE. Availability is limited, and a waitlist may apply. Additional details are available in the MouthPad^ Knowledge Center.

DISTANCE COMMUNICATION SOLUTIONS

Distance communication involves exchanging information across geographic separation through electronic means, including phone calls, emails, video meetings, and real-time messaging (3). While computer access enables device control and content creation, connecting with others across distances requires different technological approaches.

CONNECTING REMOTELY WITH AAC

AAC (Augmentative and Alternative Communication) refers to methods, devices, or systems that support or replace natural speech for individuals with complex communication needs (4). These can include speech generating devices, communication boards, symbol systems, and software applications that facilitate expression in both in-person and remote settings. For Esther, AAC solutions are essential for maintaining engagement in professional and personal interactions across distances.

Challenge: Participating in conversations, video meetings, and presentations without traditional, reliable speech, both in-person and remotely.

Esther's Solution: Speech Assistant AAC provides Esther with text-to-speech functionality that works across communication contexts.

Esther's Experience: She uses Speech Assistant AAC daily for all communication needs. In face-to-face interactions, she types messages that are synthesized into clear speech, enabling real-time conversation. For distance communication, she combines Speech Assistant AAC or ElevenLabs AI voice with video

MouthPad ^ Example Video Link - https://video.gumlet.io/6757541663a847265464088b/67ed9b510a4dc664a7482442/download.mp4

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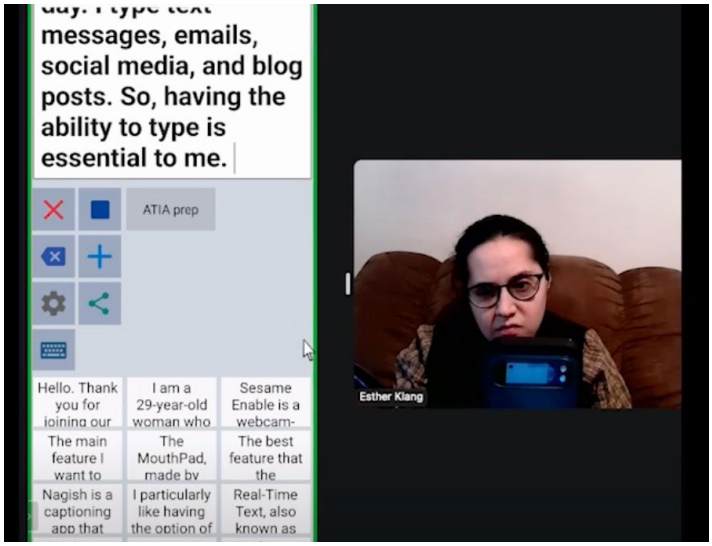

Speech Assistant AAC example

platforms like Zoom, typing messages that provide immediate voice output during video calls and online meetings.

Professional impact: Enables full participation in both in-person and virtual professional environments, supporting her work as an accessibility tester and contractor across diverse communication settings.

What She Values: The versatility of using the same communication method across all environments. Whether presenting or participating in remote meetings, text-to-speech provides consistent communication without requiring different tools or approaches.

Cost: The Speech Assistant AAC app is free on Google Play with optional paid customizations, and costs $23.99 on the Apple App Store at the time of this article.

VIDEO COMMUNICATION PLATFORM INTEGRATION

Challenge: Ensuring AAC works effectively within video conferencing platforms for professional remote communication.

Esther's Solution: Dual-device setup combining Speech Assistant AAC with video platforms like Zoom.

Esther's Technical Setup: Esther participates in Zoom meetings using two devices to support her communication needs. She uses her phone to run the Speech Assistant AAC app, which shares both audio output and her communication interface with the group in real time. Simultaneously, she connects her computer, which provides a camera so participants can see her visually. This setup allows Esther to be fully present and communicate effectively throughout the meeting using AAC technology.

What She Values: Real-time speech output that enables immediate participation in discussions and presentations without relying on chat functions that other participants might miss.

Limitations: The shared AAC interface reveals her typed messages before she speaks them, limiting private preparation. Additionally, when others share screens or documents, she loses direct access to her communication interface.

Professional workaround: To maintain participation despite these technical constraints, she types directly in shared documents and uses chat when screen sharing interrupts her AAC access.

PHONE COMMUNICATION SOLUTIONS

Text-to-Speech: Nagish

Challenge: Placing private calls, without assistance, to medical, government, and business offices that rely on traditional phone systems.

Esther's Solution: Nagish, an automatic text-to-speech and speech-to-text transcription that enables users to type responses during voice calls while receiving real-time captions of the other person's dialogue.

Esther's Experience: Nagish eliminates her need for communication partners during phone calls, providing her independence, autonomy, and privacy. She uses it for medical appointments, calling 311 for information, and contacting government offices that rely on conventional landline telephony.

What She Values: Quick reply features, especially personalized introduction messages that explain she types with head tracking software and ask for patience. Wait messages let callers know she is typing responses, preventing misunderstandings about call disconnection.

Considerations: Nagish enables calls to any phone system, including landlines, but requires patience from other participants while Esther types responses. She primarily uses the tool to type messages during calls rather than relying on the captioning feature, as she does not experience deafness or hearing loss.

Cost: Nagish is FCC-certified to provide IP-Captioned Telephone Service (IP-CTS) and IP-Relay Service. These services are available free of charge through federal reimbursement to eligible users with hearing or speech disabilities. Standard charges for data or voice minutes may apply, depending on your phone and service plan.

Real-Time Text (RTT)

Challenge: Calling and maintaining natural conversation flow with friends and family who have smartphones.

Esther's Solution: RTT is a built-in smartphone feature that allows text to appear on both phones instantly as it's being typed, creating a live text conversation during a phone call.

Esther's Experience: RTT enables fluid conversations with personal contacts using smartphones. Unlike text messaging, which sends complete chunks, RTT shows text as she types, creating more natural dialogue.

What She Values: No app downloads or setup required,

Nagish Demo Demo Link - https://video.gumlet.io/6757541663a847265464088b/67983b359f5a45b023af56ed/download.mp4

Real-Time Text Demo Link - https://video.gumlet.io/6757541663a847265464088b/67983b3524ee2fea95080817/download.mp4

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making it easy for her friends and family to use. The real-time display accommodates her typing speed while maintaining conversational engagement.

Limitations: RTT requires smartphone and provider compatibility on both ends, limiting use to calls between mobile devices only.

Cost: RTT is typically included at no extra cost on most smartphones as a built-in accessibility feature. Standard charges for data or voice minutes may apply according to your wireless service plan. RTT may not be supported by all carriers, particularly smaller providers. If RTT cannot be enabled on your phone, check with your provider for availability.

Strategic Tool Selection

Esther chooses between RTT and Nagish based on the phone system she is calling. RTT works best for personal calls with friends and family who have smartphones, allowing immediate, natural communication with no setup. Nagish is the most effective solution for calls to landlines, such as medical offices, government agencies, and businesses that rely on traditional phone systems. Having both tools available ensures she can communicate effectively in every situation, selecting the method that fits the context of the call.

SPEECH RECOGNITION

Non-Standard Speech Recognition: VoiceItt

Challenge: Typing is physically demanding and time-consuming for Esther, especially writing longer content.

Esther's Solution: VoiceItt is an automatic speech recognition software designed for non-standard speech, creating a personalized speech profile that learns each user's unique vocal patterns to provide speech-to-text transcription and speech-to-speech translation.

Esther's Experience: VoiceItt enables dictation instead of painstakingly typing with on-screen keyboards, which can be physically demanding, tiring, and frustrating for her. The system learns her unique speech patterns despite her non-standard speech, vocal cord paralysis, and breathing challenges.

What She Values: Dictating text transforms her writing process. Hearing spoken words during dictation helps her clarify, revise, and refine thoughts and correct mistakes more effectively than visual review alone. For Esther, using VoiceItt reduces the physical effort required to write professional correspondence, articles, and website content.

VoiceItt Demo Demo Link - https://video.gumlet.io/6757541663a847265464088b/67983b359f5a45b023af56f8/download.mp4

Considerations: VoiceItt's speech recognition improves with use, requiring consistent interaction to maintain optimal recognition of her individual speech characteristics.

Cost: VoiceItt is available through The Babel Group, the official distributor. At the time of this article submission, end users can purchase a subscription online for $50 per month or $500 per year. Subscriptions are available at www.thebabelgroup.com or by contacting support@thebabelgroup.com.

DIGITAL EXPRESSION AND CREATIVE ACCESS

Digital creation and expression provide essential outlets for Esther's communication, creativity, and participation that extend beyond functional access needs.

These digital tools have become essential, allowing her to share emotions, ideas, and experiences. Even though traditional vocal communication may present a challenge, her self-expression and creativity still flows.

Media Production: Fabella Creator

Challenge: Traditional video editing software requires precise mouse control and complex timeline manipulation, which can be exhausting with adaptive input methods.

Esther's Solution: Node-based content creation through Fabella Creator's simplified interface.

Esther's Experience: Fabella enables her to create interactive audio and video experiences, such as tours, introductions, and how-to guides, without prior coding knowledge.

The node-based system streamlines the workflow, reducing physical effort while she maintains creative control. This simplified production process allows her to fully bring her vision to life and share her accessibility expertise through engaging, interactive content. She also creates educational materials on accessibility and AT, contributing valuable user perspectives to professional discussions.

What She Values: Reduced time and effort make projects achievable that would be overwhelming with traditional editing software. Fabella supports her communication, educational, and instructional content creation while empowering her creative expression and professional engagement.

Considerations: Requires learning the node-based workflow approach. The platform's capabilities may seem limited compared to full video editing suites.

Cost: Fabella Creator is available as a free trial for testing. For school districts, student licenses are available at $2 per month per seat of production; unlimited usage of learning seats.

Demonstration: To access the media example Esther created, please use this direct link. You will be asked to enter an email address. If you prefer not to use your own, you may use Esther's email address to access the video: esther@estherswalkingjourney.co.

Accessibility note: The audio in the Fabella demonstration alternates between Esther's narration and descriptions of the pictures on the screen. Transcripts for all videos available upon request.

Voice Narration: ElevenLabs

Challenge: Creating narrated content for presentations, videos, or training materials can be difficult for individuals with mobility or speech disabilities. Standard text-to-speech tools often lack the expressiveness or flexibility needed for professional or creative work, and physical or vocal fatigue can limit participation.

Esther's Solution: ElevenLabs uses AI-powered voice synthesis to convert typed scripts into natural, expressive speech for her. The tool can be integrated into broader workflows to produce narration without requiring physical speech or extensive manual input.

Esther's Experience: Esther uses ElevenLabs to produce narration for presentations, videos, and instructional content. She types her scripts, and the tool generates clear, engaging audio that can be incorporated into slideshows, e-learning modules, or other digital media. Available across devices, it is accessible from her computer, tablet, or smartphone. She combines ElevenLabs with head tracking, adaptive mice, and on-screen keyboards to compose content, ensuring she can participate fully in professional and creative tasks.

What She Values: The tool reduces physical strain while supporting high-quality, expressive output. It also enhances accessibility for audiences who rely on audio content and helps maintain productivity and engagement when traditional speech is not a reliable option.

Considerations: ElevenLabs requires internet access to function, and accessing premium features involves additional cost. Users may also encounter a learning curve to fully integrate the tool into their workflow.

Cost: ElevenLabs offers a free tier with limited usage, plus subscription plans for higher output. Pricing is subject to change; current details are available on the ElevenLabs website.

TECHNOLOGY INTEGRATION AND SELECTION

BUILDING COMPREHENSIVE SYSTEMS

Effective AT implementation requires understanding how different solutions complement each other rather than viewing them as isolated tools. Esther's daily workflow demonstrates a strategic combination of technologies: head tracking or alternative mice for computer access, AAC for remote meetings, specialized phone solutions for business and personal calls, and dictation or creative tools for content creation.

This integrated approach recognizes that no single technology solves all access needs. Different communication contexts require different tools, and backup systems help ensure continued access during equipment maintenance, charging,

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fluctuations in energy levels, or changes in her environment.

SUSTAINABILITY CONSIDERATIONS

The discontinuation of Sesame Enable reinforces the importance of technology sustainability alongside immediate functionality. End-users invest significant time mastering and adapting to new systems, so sudden discontinuity can disrupt established workflows and professional responsibilities.

After the company ceased operations in late 2019, Sesame Enable made its solutions available for free. This decision acknowledged users' investment and dependency, ensuring the technology remained accessible to the community. However, there are no future updates or support. This experience has shaped Esther's evaluation of current alternatives, emphasizing both reliable functionality and the stability of the companies providing these solutions.

SELF-ADVOCACY AND TECHNOLOGY NAVIGATION

Esther's path to comprehensive AT solutions began without professional support. Her determination to achieve access and communication independence led her to research solutions, contact vendors directly for technical guidance, and systematically test different technologies until she developed an effective, personalized setup.

This independent path, though challenging, created extensive user expertise about real-world implementation, including device reliability during extended use and fatigue management. Her experience demonstrates the resilience users bring to AT adoption and now informs her advocacy efforts to ensure others have better access to comprehensive solutions and professional guidance from the start.

CONCLUSION

Esther's morning digital routine represents more than personal achievement; her strategic integration of computer access, communication, and creative tools illustrates how a comprehensive AT and AAC portfolio can support professional participation as well as recreation through content creation and digital expression.

This integrated approach addresses specific barriers while supporting engagement and advocacy opportunities in both personal and professional settings. Esther's experiences provide practical guidance for AT professionals, showing how multiple technologies working together often succeed where individual tools may fall short.

Her current work as an accessibility contractor and advocate builds on her journey to create resources that help others access effective AT and AAC solutions. The professional independence she demonstrates each morning now guides others toward their own comprehensive digital access.

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