Assistive Technology Resources for Children and Adults with Disabilities

Closing The Gap

Solutions

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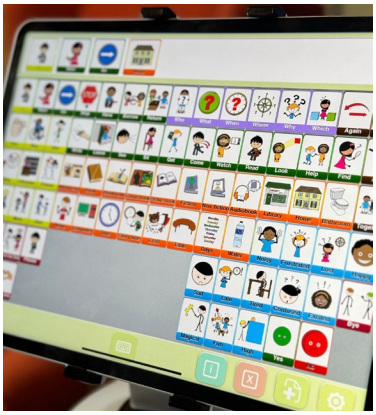
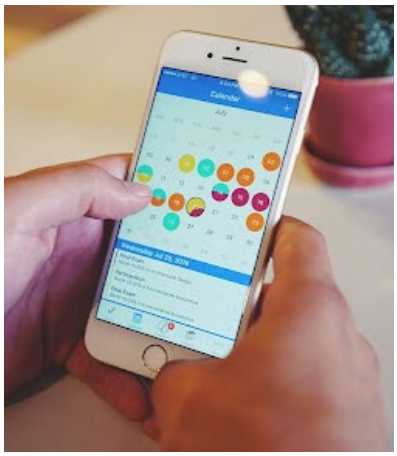
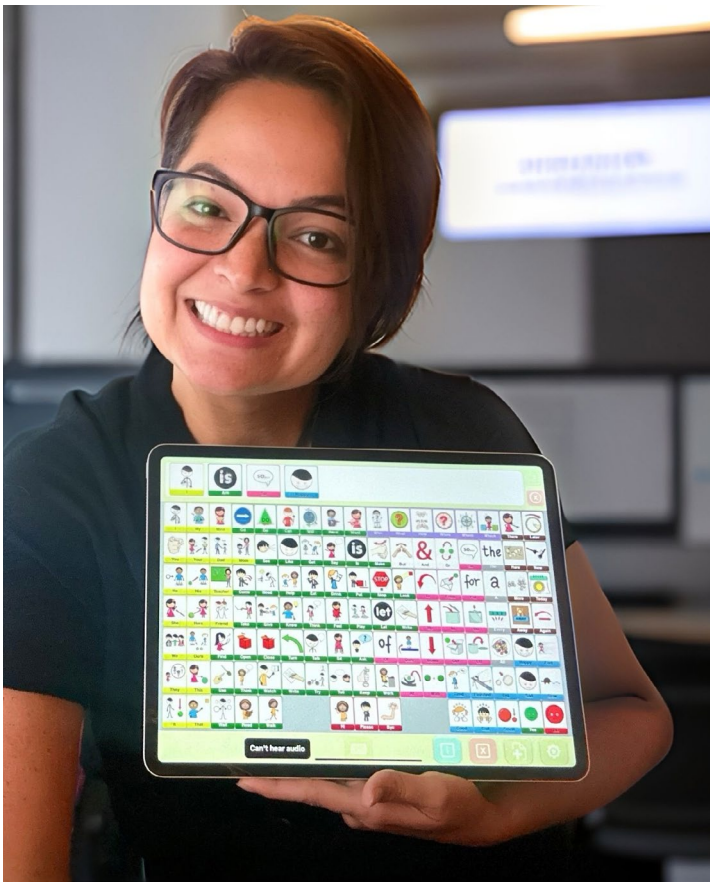




Advocacy for Communication Access in Public Spaces:

You can join the fun too!



Barbara Fernandes holding iPad with app Expressive Go, which is a replica of the physical playground communication board.

It's a scene we're all familiar with: ramps providing essential access to public spaces. Yet, when it comes to communication access in these same spaces, we are only at the beginning of our journey. Surprisingly, many readers of disability-focused publications might be startled to realize that the concept of communication boards is still relatively unknown to the general public. I often catch myself wishing that the energy we expend in online debates could be redirected towards advocating for tangible, effective changes in our communities.

In this article, I aim to share my personal journey of advocacy towards communication access. From confronting challenges to celebrating victories, I will outline the steps I've taken to make a significant impact in introducing communication access to public spaces. My experiences, along with those of fellow advocates, are not only inspiring but also replicable. This movement is open for all to join, and through this piece, I hope to empower and guide others to participate in making a lasting difference.

I WAS A FAILING ADVOCATE UNTIL I HEARD THIS ONE THING

A couple of years ago, as I wandered through the exhibit hall at a conference, my attention was captivated by a poster presentation on playground communication boards. This piqued my interest, as I had been struggling to advocate for communication accessibility in my community. Despite my extensive resources as a speech-language pathologist, entrepreneur, and founder of Smarty Symbols, my efforts had hit a wall. Let me share why:

BARBARA FERNANDES, an award winning Brazilian-American SLP, immigrated to the US as an adult. She went on to become one of the most successful entrepreneurs in her field, founding two businesses(Smarty Ears and Smarty Symbols) and launching seventy successful products, and a symbol set for communication.Fernandes was awarded an Innovation Research grant by the NIH, and released a ground-breaking technology called the Smarty Ears Online. Barbara is the best-selling author of the book: “Sis, you got this. From Surviving to Thriving as a Minority Speech-Language Pathologist”, and has been involved in designing and placing hundreds of public display communication boards around the country. Connect with Barbara here: https://barbarafernandes.com/

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My initial target was a local park. I had several promising exchanges with the director of parks and recreation, but as the pandemic emerged, our communications dwindled. Undeterred, I envisioned creating the most innovative communication board. I meticulously photographed the playground on a sweltering summer day, tasking my team to design custom images for each piece of equipment.

After painstakingly finalizing the vocabulary, design, and incorporating the city logo, my creation was ready. But to my dismay, despite offering a custom, free design, the project stalled due to bureaucratic hurdles with the city's printing contract. Frustrated, the project languished in my folders.

The game-changer came when Catherine Fredricks suggested during her presentation: "Contact your city mayor!" With no prior experience in engaging public officials, I turned to my local Facebook community for support. Their response was overwhelming, and soon, I found myself presenting a prototype communication board at a town hall meeting in a Texas suburb.

Barbara Fernandes, standing at the Rowlett City Hall meeting to advocate for the first communication board for the city of Rowlett.

The result? The board was finally printed and has proudly stood in the park for two years, bridging communication gaps and enriching lives.

STREAMLINING INCLUSIVITY: A SIMPLIFIED PATH FORWARD

My initial foray into placing a communication board was a revelation. This journey illuminated the myriad of challenges involved in this endeavor and fueled my desire to simplify the process for others. Since then, I've been instrumental in situating hundreds of communication boards across the country, transforming spaces into hubs of inclusivity. From city and school playgrounds, to zoos and baseball fields, the boards not only provide communication access, but it is instrumental in building awareness and normalizing all forms of communication.

The early attempts I observed in various locations often involved makeshift solutions, like screenshots of device screens. While any effort towards inclusivity is commendable, these initial steps, often facilitated by forward thinking advocates with limited design resources or playground companies, were lacking in several respects. Including, but not limited to representation of their images and linguistic access.

Educators and advocates found themselves burdened with a daunting task: not only did they have to persuade city management to embrace the idea of a communication board, but they also faced the overwhelming task of designing these boards on a large scale and navigating the complexities of outdoor printing and installation.

Recognizing the need for a more efficient approach, I committed to streamlining this process. My goal was to alleviate the heavy lifting for those eager to create more inclusive spaces. This initiative wasn't just about communication access; it is also about raising awareness for alternative communication methods, ensuring that inclusivity wasn't an arduous task, it is about making everyone feel welcomed in these spaces.

Through this endeavor, we've managed to turn a challenging process into a more accessible and manageable pursuit, encouraging communities everywhere to recognize and adopt inclusive practices with greater ease and impact.

Custom City Playground Communication Board, designed by Smarty Symbols currently at the Dreams Park in Fort Worth, Texas.

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We've identified optimal vocabulary, design, and materials that withstand various weather conditions. Moreover, we've developed resources for advocacy, outreach, and funding, culminating in the "**All Voices, Any Place**" initiative—a testament to our commitment to inclusivity in every space. All the information can be found on https://playgroundcommunicationboards.com/

Playground Communication Boards
https://playgroundcommunicationboards.com/

BRIDGING GAPS: THE UNDERRATED IMPORTANCE OF COMMUNICATION ACCESS AWARENESS

In our daily lives, we often operate within our own 'bubbles'—groups with specific knowledge and perspectives, believing that a majority of the world shares our understanding. These bubbles could encompass areas like disability awareness, accessibility, speech therapy, assistive technology, diversity, or even realms as universal as motherhood.

Over the past two years, I've reached out and connected with people in various bubbles, many of which were unfamiliar territories for me, including parks and recreation departments, public offices, and school principals. A striking realization during these interactions was the vast gap in understanding between those outside the disability or neurodiversity spheres and the actual knowledge they possess and most of you reading this article. Even in reading comments on my own social media, in response to my efforts, I realized how even my close friends who I assumed consumed a lot of my content, still knew so little.

The misconceptions I've encountered about Autism, accessibility and disabilities were eye-opening, underscoring the immense work that lies ahead. This gap should not be reason to panic, but it should drive you to step out of our accessibility bubble and have longer chats with our close friends who belong to other "bubbles".

Equally crucial is raising public awareness, especially among families who may not have access to high-tech devices or early intervention resources. These are often communities lacking in resources, information, and financial means. As an immigrant and a former in-home clinician to Spanish-speaking families, I understand the necessity of reaching these families where they are, and as early as possible.

Public spaces like city parks, libraries, and playgrounds are frequented by families from diverse backgrounds. Here, communication boards serve as an invaluable tool, not only for facilitating communication but also for educating the public.

The communication boards I've designed incorporate a few crucial elements to maximize their impact:

1. Clear instructions on their purpose and usage.
2. Information about free local resources, such as early childhood centers.
3. A QR code providing access to a free speech-generating app, ExpressiveGo, for immediate use on personal devices beyond public spaces.
4. Communication boards must always take into consideration linguistic makeup of communities

These additions ensure that the boards are not just tools for communication but also gateways to broader awareness and resource accessibility, fostering a more inclusive and informed community.

This realization also spurred the launch of the "**All Voices, Any Place**" initiative in Boston in 2023, which successfully led to the design and donation of 28 communication boards across the city within just two weeks.

ALL VOICES, ANY PLACE: A PIONEERING INITIATIVE FOR INCLUSIVITY

Launched in Boston in 2023, "All Voices, Any Place" is an initiative I spearheaded with a dual mission:

1. **Addressing Early Intervention:** Many families with non-speaking children are either unaware of available services and technology or lack immediate access to them. This gap often leads to delayed communication development in children, posing potential long-term challenges. Early intervention is key, and our goal is to bridge this knowledge and access gap.
2. **Inclusivity in Public Spaces:** Non-speaking individuals, particularly children, often find public spaces like parks, playgrounds, zoos, aquariums, and libraries inaccessible and isolating. Traditional communication systems are seldom seen in these areas, reinforcing a sense of exclusion.

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As the owner of Smarty Ears, with a background in creating innovative technology, I realized the potential impact of leveraging our expertise to address these challenges. This led to a strategic collaboration between Smarty Ears and Smarty Symbols, combining our resources and knowledge.

STRATEGIES AND PROJECTS UNDER "ALL VOICES, ANY PLACE":

1. **Expressive GO:** This free speech-generating app is a cornerstone of our initiative, designed to introduce families to Augmentative and Alternative Communication (AAC) systems. Expressive Go includes a speaking copy of each one of the communication boards designs for public spaces completely free of cost to families. By removing financial barriers, Expressive Go encourages early adoption of AAC for non-speaking individuals and their families, raises the awareness of a form of communication, and provides local information about available resources. Expressive Go can become a mainstream door to all any alternative communication device the child will eventually use. Expressive Go can be upgraded for a low cost price, which provides the user the ability to fully edit and customize the app with 30,000 vocabulary options.

Expressive Go app on iPad : Free Download.

2. **QR Codes on Communication Boards:** A novel feature on all Smarty Symbols Communication Boards is the addition of a QR code, directly linking to the free Expressive Go app. This allows families to instantly download a speaking version of the board, facilitating immediate and practical use of AAC systems.

Communication board designed by Smarty Symbols for a city playground. Ir includes a QR code for a speech generating app which mirrors the board. Located in Draper, UT.

3. **First Exposure to AAC:** For many families, our communication boards in playgrounds provide their first encounter with speech-generating devices. This exposure is vital in opening up new avenues for effective communication and early intervention. As I shared previously, we all assume families will dream up the idea that pictures can be used to generate audio communication and search for a device, this does not happen out of thin air.

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4. **Collaborative Approach:** We also actively encourage and support community involvement in their own efforts. A key aspect of our initiative is to provide educators, parents, and communities with the tools and knowledge they need to advocate for communication boards in their own communities. We offer guidance on how to approach local authorities, navigate funding options, and effectively present the case for these essential tools in public spaces.

Playground Communication Board for a Prek playground.

5. **Partnerships for Funding and Support:** Recognizing the financial challenges that often come with such projects, we actively seek partnerships with companies willing to sponsor local initiatives. These collaborations are crucial in covering the costs of communication boards and installation materials, ensuring that financial constraints do not hinder progress.

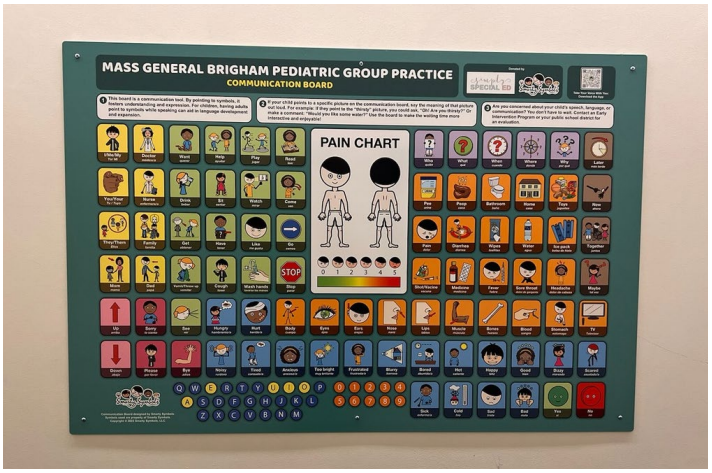
An example of the impact of this initiative was the successful launch I led in Boston last November, marking a significant step in our journey towards creating more inclusive communities.

BOSTON INITIATIVE: A MILESTONE IN COMMUNITY INCLUSIVITY

In the days that led to the American Speech-Language and Hearing Convention, I realized the potential to kick off this initiative with a massive collaborative effort to impact the city so many of us, advocates would visit. I wondered what could happen if we could identify and donate a communication board to a few locations in Massachusetts.

Recognizing the hurdles often associated with such inclusive projects, I believe this was an opportunity to put All Voices, Any Places to the test. The partnerships with companies and individuals passionate about making a difference was essential. The response was overwhelming, leading to a rapid and fully-funded implementation of 28 communication boards across Boston.

This initiative, under the banner of "**All Voices, Any Place - Boston 2023 Edition,**" not only addressed immediate communication needs but also sparked a broader movement towards embracing diversity in public spaces. This collective effort brought together various entities, all united in their commitment to fostering inclusivity and accessibility in public spaces.



Communication Board at Mass General Brigham Pediatrics design to support communication prior to pediatric office visits.

As a result, places such as Boston Public Schools, the Franklin Zoo, community parks, a bookstore, a church playground, and the Massachusetts General Hospital Pediatric Group Practice were equipped with tailor-made communication boards. The immense groundwork for this extensive project, involving calls, emails, social media outreach, and recipient coordination, demonstrated the extraordinary achievements possible through united efforts and shared passion.

Communication board at a waiting room at a speech therapy clinic at the Boston Ability Center.

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AMPLIFYING VOICES: INDIVIDUAL ADVOCACY AND UNIQUE CONTRIBUTIONS WE ALL CAN MAKE

Advocacy doesn't have to be complex or require you to quit your day job. It can be as simple as a phone call or joining an existing initiative for a limited time. Here are some inspiring examples of how individual advocacy can significantly impact communities:

- **Amanda Schaumburg's Zoo Advocacy:** Based in Texas and a longtime colleague, Amanda Schaumburg of *Panda Speech* promptly sponsored three communication boards. She went a step further by reaching out to aquariums and zoos in the Boston area, advocating for more inclusive spaces. Her efforts led to the design of the first zoo communication boards, now installed at the Franklin and Stone zoos in Massachusetts. Despite facing rejections from several locations, her outreach planted seeds for future change, proving how a few minutes spent reaching out can make a difference in our communities.

Communication board at a waiting room at a speech therapy clinic at the Boston Ability Center.

- **Darla Gardner's Unique Approach:** Darla Gardner, of *Ms. Gardenia's Speech Room*, a fellow entrepreneur, used her personal interests to effect change during the Boston initiative. Thanks to her advocacy, I had the opportunity to design two unique communication boards: one for a bookstore employing disabled adults and another for a church playground. Her initiative is a compelling example of leveraging personal interests and connections to promote awareness and foster a sense of belonging in diverse community spaces.
- **Ashley Causey's Mission in Virginia Beach:** Shifting focus from Boston to Virginia Beach, Ashley Causey, a pediatric speech-language pathologist, embarked on her own journey of advocacy. Ashley's journey of advocacy commenced in June 2022 when she reached out to me via LinkedIn, seeking support for a vision close to her heart. What unfolded over the next year was a testament to meticulous planning, relentless dedication, and community collaboration. Numerous meetings with city officials and intensive fundraising efforts marked Ashley's journey. Key organizations, including United Way of Southampton Roads, Sentara, The Children's Hospital of the King's Daughters (CHKD), and Kroger, recognized the value of this endeavor and generously sponsored the communication boards. Their support was pivotal, providing not only the necessary funding but also lending credibility and expanding the project's reach. Today, 11 communication boards stand tall in Virginia Beach playgrounds, each a testament to the persistence, collaboration, and unwavering vision of Ashley Causey. I am so happy that I was able to support her vision.

Ashley Causey with one of the communication boards she sponsored in Virginia Beach.

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- **Derek Walz's Revolution in Wisconsin:** Derek Walz's Playground Revolution in Wisconsin: Now, let's turn to Pewaukee, Wisconsin, where a young boy named Derek Walz showed us what true initiative looks like. At just 8 years old, Derek noticed a classmate who couldn't communicate during playtime. This didn't sit right with him. He talked to his mom, Cathy, about making their playground a place where every kid, no matter how they communicate, can have fun. Derek started fundraising and before long, he had raised a whopping $5,000. We worked closely with his mom and designed and shipped the boards, which were ready for installation. Derek actively participated in this process. It demonstrates that advocacy and action, regardless of age, can have a powerful impact on creating more inclusive environments.

These stories, from Amanda's outreach to zoos to Derek's playground revolution, illustrate how individual efforts, regardless of age or background, can lead to impactful changes, fostering inclusivity and understanding in our communities.

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BUILDING YOUR OWN COMMUNICATION BOARD? KEY CONSIDERATIONS TO KEEP IN MIND:

1. **Linguistic Diversity:** When creating communication boards, it's crucial to consider the linguistic makeup of the community that will use them. These boards aren't just tools for communication; they're also instruments for raising awareness. This means you need to think about the languages spoken in your community and include them on the boards. This consideration should extend not just to the words used but also to the informational text on the board. I've had the privilege of designing boards for cities across the U.S. that incorporated languages like Spanish, Portuguese, and Hawaiian alongside English.

City Playground Communication Board in Hawaii .

2. **Cultural Sensitivity:** The project for Hawaiian playgrounds brought an enlightening perspective. We realized that even basic symbols, like the one for water, needed reconsideration. Our usual representation of water with a plastic bottle didn't align with the environmental consciousness of the Hawaiian community. This experience was a valuable lesson: every community has its uniqueness, and their communication solutions should reflect that distinctiveness.
3. **Representation in Symbols:** My journey in assistive technology started with a realization about the lack of diversity in symbols. Although there have been significant improvements, it's important not to become complacent. I still encounter many communication boards online lacking representation of females, disabled individuals, or various racial and ethnic groups. Public communication boards, as symbol representation should go beyond skin tones; they should celebrate the rich diversity of our communities. Embracing our differences and showcasing them in our designs is not just a choice; it's a responsibility.

It's clear that the journey towards creating accessible communication in public spaces is both challenging and rewarding. Each story shared here, from my own aha-monts, to Amanda's zoo advocacy and Derek's playground revolution, underscores a powerful truth: advocacy, regardless of its scale, can create waves of change. Our lived experiences are not just narratives of success; they are blueprints for action, testaments to the power of persistence, creativity, and collaboration in making our world more inclusive.

The essence of this movement is not confined to the installation of communication boards; it's about fostering a society that recognizes and respects diverse forms of communication. It's about creating spaces where every individual, regardless of their ability to speak, feels seen, heard, and valued. This movement is an open invitation to each of us to participate, advocate, and contribute to a world where differences are not just tolerated but celebrated.

As you finish reading this article, consider how you can be part of this transformative journey. Whether it's by educating others about the importance of communication access, advocating for inclusivity in your local community, or simply sharing this message, your contribution matters. Together, we can continue to break down barriers and build a world where everyone has a voice. ■

Playground Communication Board at Jackson Justice Complex

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UPCOMING LIVE WEBINARS

PROFFESIONAL DEVELOPMENT

CEUs are provided by the AAC Institute and are available for live webinars at no additional fee (does not include sponsored webinars unless noted). A 60-minute webinar = 0.1 CEUs. A 90-minute webinar = 0.2 CEUs

Switching to Self-Regulation: Using Assistive Technology to Create a Sensory-Based Calming Space for Students with Complex Communication & Access Needs

By Kelly Clark
Thursday April 11, 2024
3:30 pm – 4:30 pm (Central Daylight Time)

Do your students seem to experience a variety of emotions that you struggle to interpret? Do your students have trouble expressing their self-regulation needs due to inconsistent communication or access to assistive technology? Do you need guidance in providing students with accessible tools to regulate themselves?

This presentation will prepare you to advocate for your students' emotional and regulation needs and provide you with the tools to create a calming space where students can safely practice self-regulation skills in a supportive environment. You will leave with practical strategies for using readily available materials that can be simply switch-adapted to support students' regulation needs and target a variety of sensory systems..

Systems and Structures that Support Assistive Technology

By Sarah Davidson and Nickie Woods
Tuesday, May 7, 2024
4:00 pm – 5:00 pm (Central Daylight Time)

Setting up your class for students with complex learning needs requires a strong foundation in best practices for complex learners. Seeing is believing so come and get inspired! Learn how one public school, Fletcher Miller Special School, in Lakewood, CO, has built a program specializing in the complex and emergent population ages 3-21 years.

Participants will be given a front row seat to discover how AT at Fletcher Miller is supported by environmental considerations as well as school-wide planning and problem-solving structures (that include all team professionals). Explore examples of how AT, when powerfully combined with quality curriculum and specialized and targeted planning for emergent learners, is yielding powerful results.

Designing Accessible Content to Include All Students

By Rose Raciot and Kristin Leslie
Wednesday. May 15, 2024
3:30 pm – 5:00 pm (Central Daylight Time)

Do you have students who are facing barriers to accessing core curriculum due to language, learning style or disability? Foundational to Multi-tiered Systems of Support (MTSS) is the belief that ALL students need access to core instruction. Assuring that students have "accessible versions of educational materials may mean the difference between learning barriers and learning opportunities." (National Center on Accessible Educational Material).

As educators, we are tasked with providing learning materials that are accessible to diverse student groups. What resources are available to guide educators through this process? The Special Education Technology Center (SETC) in Washington State has created a free online learning course in an Open Educational Resources (OER) format to help educators navigate the process of vetting and creating educational material that is fully accessible to students, staff, and parents. Join us to discuss how to break down access barriers by integrating this professional development content in your classroom and district practices.

Marvelous, Magical Minspeak

By Debbie Witkowski
Tuesday. August 20, 2024
11:00 am – 12:00 pm (Central Daylight Time)

Most robust AAC language systems represent language through single-meaning pictures and alphabet-based strategies, such as spelling, word prediction, and printed words. Minspeak systems are unique in that they offer a third method of representing language known as semantic compaction.

This webinar will explore the components of Minspeak systems that lead to successful communication including the semantic organization into word families, the predictable architecture of vocabulary storage, and the design that leads to motor automaticity. Join us as we explore the marvels and magic of Minspeak systems and learn how the design of Minspeak programs and accompanying tools facilitate language learning and use.

REGISTER NOW!

Research You Can Use

Summary: The workweek of an Assistive Technology Specialist seldom features dedicated time to engage in locating and reading the latest research. The purpose of this article is to offer busy AT Specialists a summary of ten recent research articles and some recent AT and educational technology policy reports. Suggestions on how this research has the potential to improve professional practice are provided.

The workweek of an Assistive Technology Specialist seldom features dedicated time to engage in locating and reading the latest research. AT Specialists without routine protected time dedicated to studying the latest advances in AT research face a significant barrier to improving professional practices. This is an unfortunate artifact of existing AT service delivery systems. Ideally, the AT profession will explore new ways to become better consumers of research.

The purpose of this article is to offer busy AT Specialists a summary of recent research articles and reports that have the potential to improve their professional practice. The article is organized in three sections. First, I'll highlight 10 recent journal articles that offer some interesting findings. A QR code is provided for each article so you can access the original source document. In some cases you may find the need to ask your local library to obtain a PDF copy of the article via inter-library loan (ILL). Second, I'll provide links to some recent AT policy reports. Finally, I'll share links to some recent educational technology policy reports.

While some readers may enjoy reading everything on this list, it may be helpful to be selective. That is, focus specifically on topics that you find most relevant for your work. And, be sure to share your discoveries with colleagues to increase the impact of evidence-based practice.

This section describes ten recent research articles organized around seven AT related topics.

ARTIFICIAL INTELLIGENCE

Rice, M. F., & Dunn, S. (2023). The use of artificial intelligence with students with identified disabilities: A systematic review with critique. *Computers in the Schools, 40*(4), 370-390.

https://www.tandfonline.com/doi/abs/10.1080/07380569.2023.2244935

This article is one of the first to analyze the literature regarding the use of AI with students with disabilities. As might be expected, as of 2023 there is not much published research since this topic just came to the public's attention via ChatGPT in December 2022. However, the authors note some disturbing biases concerning how AI applications for people with disabilities have been discussed. That is, in the early AI disability literature, AI is presented as a tool to compensate for deficits, rather than as a tool to empower. This article is very relevant for any AT specialist/team seeking to launch an AI early adoption initiative.

DAVE EDYBURN, Ph.D., is Senior Research Scientist and Professor Emeritus, University of Wisconsin-Milwaukee. His research and teaching interests focus on the use of technology to enhance teaching, learning, and performance. Email: edyburn@uwm.edu

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BEHAVIOR

Kearney, K. B., & Pistorio, K. H. (2023). Creating electronic-literacy based behavioral interventions. *Journal of Special Education Technology, 38*(1), 86-92.

https://journals.sagepub.com/doi/full/10.1177/01626434211043858

AT specialists often are asked to assist with behavioral interventions for students with disabilities. Kearney and Pistorio describe how behavioral goals can be addressed in the context of using technology to achieve literacy objectives in a strategy known as Literacy Based Behavioral Interventions (LBBIs) [very similar to the process of creating digital social stories]. With the assistance of the AT Specialist, teachers will find this intervention useful for creating digital behavioral literacy resources for students with autism or intellectual disabilities. This work is considered a research-to-practice article (and, easy to read!) because of its emphasis on how-to implement an evidence-based practice.

TECHNOLOGY INTEGRATION

Kearney, M., Young, K., & Burke, P. F. (2023). An examination of special education teachers' digital practices. *Journal of Special Education Technology, 38*(3), 314-326.

https://journals.sagepub.com/doi/full/10.1177/01626434221094798

While smartphones are ubiquitous, it is not clear that students with special educational needs or their teachers routinely use such tools. The article reports the results of a survey of a large number of primary and secondary special education teachers in Australia about how they use mobile technologies with their students. The results reveal a range of digital practices regarding use of mobile technologies in the classroom, outside of the classroom, and at home. This work has a strong conceptual framework and provides insight for AT teams interested in expanding the integration of mobile technologies – particularly as a service delivery resource in rural settings.

McMahon, D. D., McMahon, A. K., Anglin, M., Abrams, K., Wilds, K., & Aumel, A. (2023). Digital health, fitness, and wellness tools for students with disabilities. *Journal of Special Education Technology, 38*(3), 392-403.

https://journals.sagepub.com/doi/full/10.1177/01626434221094795

The health and wellness of students with disabilities is an increasingly recognized as an area that needs more attention. In this article, McMahon and colleagues summarize the results of a comprehensive search for health and wellness apps and wearable technologies (e.g., exercise, nutrition, wellness) that have particular application for individuals with intellectual disabilities. They summarize over 30 products! This work supports the responsibilities of IEP teams to consider how the appropriate assistive technology might improve educational outcomes. This type of article is especially valued by practitioners because of the amount of the amount of time it saves trying to find new tools. AT specialists can add additional value by trialing some of the products.

Thapliyal, M., & Ahuja, N. J. (2023). Underpinning implications of instructional strategies on assistive technology for learning disability: A meta-synthesis review. *Disability and Rehabilitation: Assistive Technology, 18*(4), 423-431.

https://www.tandfonline.com/doi/abs/10.1080/17483107.2020.1864669

Meta-analysis is considered one of the highest levels of research quality. However, this article is mis-titled as it more of a descriptive literature review that seeks to identify what AT tools and instructional strategies are most helpful for students with learning disabilities. The authors present an interesting theoretical framework, but it is not clear that their primitive analysis will be helpful in practice. A great example of how scholars need to critique each other's research and find pathways forward to answer important outcome questions in new research studies.

POWERED MOBILITY

Arps, K., Darr, N., & Katz, J. (2023). Effect of adapted motorized ride-on toy use on developmental skills, quality of life, and driving competency in nonambulatory children age 9–60 months. *Assistive Technology, 35*(1), 83-93.

https://www.tandfonline.com/doi/abs/10.1080/10400435.2021.1956643

Impaired motor ability is a characteristic of several developmental disabilities. As a result, researchers have explored the use of adaptive motorized toys to introduce students to powered mobility AT. This study examines the impact of a ride-on-toy with nine young children ages 10-35 months. The research is complex with the number of assessments used to measure outcomes (see Table 2). The results demonstrate a positive impact on motor ability and cognitive functioning as a result of the 16-week program but minimal advances in communication ability. The implications are discussed regarding the quality of life

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improvements and the importance of providing this type of early intervention program. The quality of the research evidence, from this study and others like it, suggests that Occupational Therapists and AT specialists should consider the development of a powered mobility program for young children.

Rosen, L., Plummer, T., Sabet, A., Lange, M. L., & Livingstone, R. (2023). RESNA position on the application of power mobility devices for pediatric users. *Assistive Technology, 35*(1), 14-22.

https://www.tandfonline.com/doi/10.1080/10400435.2017.1415575

This article provides an update of a previous RESNA Position Paper concerning the use of powered mobility devices by young children. In practice, there are often concerns about the appropriateness of these technologies that often delay or prevent early intervention. This Position Paper provides a review of the literature and synthesis of expert opinion and recommends that powered mobility devices be considered as part of early childhood programming for children with disabilities. This article is one form of evidence that helps school leaders identify the evidence-base supporting their instructional interventions. Interested readers may wish to explore the entire library of RESNA Position Papers as they search for the best available evidence regarding AT practices. Learn more: https://www.resna.org/Resources/Position-Papers-and-Service-Provision-Guidelines

SMART ENVIRONMENTS

Landuran, A., Sauzeon, H., Consel, C., & N'Kaoua, B. (2023). Evaluation of a smart home platform for adults with Down syndrome. *Assistive Technology, 35*(4), 347-357.

https://www.tandfonline.com/doi/abs/10.1080/10400435.2022.2075487

The market place features many home automation tools. Yet, little is known about how home automation systems can be designed to enhance the independent living experience of individuals with disabilities. This study explored how smart home automation could be used to promote independent living of eight adults with Down Syndrome over a six month period. The results suggest a variety of applications for ensuring the safety of the individuals as well as opportunities for instruction regarding behaviors that promote independence. This work has considerable application for both AT Specialists and Transition specialists when creating transition plans.

Smith, E., Sumner, P., Hedge, C., & Powell, G. (2023b). Smart-speaker technology and intellectual disabilities: Agency and wellbeing. *Disability and Rehabilitation: Assistive Technology, 18*(4), 432-442.

https://doi.org/10.1080/17483107.2020.1864670

As virtual assistants become ubiquitous, there is considerable interest in the application of this technology for individuals with cognitive impairments. This extremely well-designed experimental study from the United Kingdom examined households that already has a smart speaker and those that didn't. Among those that didn't, the participants were divided into a control group and a group that was given a smart speaker. The results reflect gains in the perceived social value of the smart-speaker, the entertainment value of the technology, and an increased self-report of independence. The evidence level of this research is high as a randomized control trial. The qualitative results suggest many ideas for future research and single case studies with students and their families. This article is a very good example of high-quality research with practical implications.

TEXT TO SPEECH

Silvestri, R., Holmes, A., & Rahemtulla, R. (2022). The interaction of cognitive profiles and text-to-speech software on reading *comprehension of adolescents with reading challenges. Journal of Special Education Technology, 37*(4), 498-509.

https://journals.sagepub.com/doi/abs/10.1177/01626434211033577

Despite the ubiquitous availability of text to speech (TTS) technologies, the use of TTS remains controversial. This study examined the performance of 94 eighth grade students on reading comprehension tasks under two conditions (with TTS, without TTS) in order to try and understand if some subgroups derived more benefit from TTS than others. The results demonstrated a large effect size (1.58 grade level increase) for students with a dyslexic profile. The authors argue that one-size-fits-all distribution of TTS to all students may not be beneficial. This article is certainly one that AT Specialists may wish to share and discuss with the entire AT team to develop a common understanding of how TTS functions as an AT support versus its roles as a UDL support.

NOTEWORTHY AT REPORTS

Four new AT reports provide a global perspective on the adoption and use of AT (see Table 1). These reports should be required reading for all AT teams as there are numerous insights about barriers and best practices.

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The *What Works to Improve Access to AT?* report was created by a coalition known as AT2030. The intent is to provide some ambitious goals for advancing the use of AT around the world. This report is useful for anyone interest in the application of AT around the world.

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF joined forces to produce a new report: *Global Report on Assistive Technology*. This 160+ page report provides a comprehensive review of data-based evidence about access to AT around the world. The report offers keen insight into AT systems, what is known, and what we need to know to enhance the equitable distribution of AT.

In January 2024, the U.S, Department of Education released a Dear Colleague letter and a companion document outlining myths and facts about AT (see Table 1). The letter encourages school leaders to consider the importance of AT as they developing IEPs and instructional programs to meet the educational needs of students with disabilities. The timing of the release of these documents coincided with the release of the 2024 National Technology Plan. AT teams will want to carefully example both the letter and myths document and consider how this information can be shared within their organization.

Table 1
Recent Policy Reports on Assistive Technology

Bell, D., Layton, N., Holloway, C., & Austin, V. (2022). What works to improve access to AT? Interim findings from AT2030. GDI Hub.
https://at2030.org/what-works-to-improve-access-to-at/

World Health Organization (WHO) and the United Nations Children's Fund (UNICEF). (2022). Global Report on Assistive Technology. Author. https://iris.who.int/bitstream/handle/10665/354357/9789240049451-eng.pdf

Dear Colleague Letter (US Department of Education)
https://sites.ed.gov/idea/files/DCL-on-Myths-and-Facts-Surrounding-Assistive-Technology-Devices-01-22-2024.pdf

Myths and Facts About Assistive Technology (US Department of Education)
https://sites.ed.gov/idea/files/Myths-and-Facts-Surrounding-Assistive-Technology-Devices-01-22-2024.pdf

NOTEWORTHY EDUCATIONAL TECHNOLOGY REPORTS

Given that AT is often deployed in the context of a school's educational technology system, it is important for AT Specialists to have some awareness about the issues and trends in educational technology. Table 2 highlights three recent reports about educational technology.

The SETDA 2023 State EdTech Trends Report was created by the State Educational Technology Directors Association and reveals a number of trends and issues that they are monitoring as they manage the current ed tech infrastructure and look to the future. It is important to note the concerns about AI and cybersecurity that are likely to drive many future conversations concerning technology use in schools.

UNESCO has produced a large report (600+ pages!) identifying the contributions and shortcomings of educational technology during the Covid-19 pandemic. Fascinating reading as the profession tries to understand the lessons learned. Despite the considerable length of this report, there is no specific mention of assistive technology. However, as the U.S. continues to struggle with the post-pandemic learning loss gaps, it is important to continue to monitor the inequitable outcomes and how technology might help reverse learning loss.

Finally, the long awaited update of the National Education Technology Plan was released in late January 2024. In this report you will see considerable effort to include AT and UDL in the general scope of educational technology provision. In recent years this report has been periodically updated and has proven to be influential in directing state and local decision-making as well as influencing the vendor community. This document should be required reading for all AT leaders.

Table 2
Recent Policy Reports on Educational Technology

SETDA 2023 State EdTech Trends Report
https://www.edtechdigest.com/2023/09/18/setda-2023-state-edtech-trends-report/

An Ed-tech Tragedy? Educational Technologies and School Closures in the Time of COVID-19 (UNESCO)
https://unesdoc.unesco.org/ark:/48223/pf0000386701

National Education Technology Plan
Office of Educational Technology, (2024). A call to action for closing the digital access, design, and use divides. U.S. Department of Education. https://tech.ed.gov/netp/

CONCLUSION

Busy AT Specialists need new tools for locating, accessing, and consuming research that will help them improve professional practice. The intent of this article was to highlight recent advances in the research and policy literature that may be helpful in finding specific resources for fostering professional development.

Finally, some readers may be interested in learning how to create a Google Scholar alert so that they will be notified each time new research is published on a topic of interest. Here's a link to a short video that explains how to create your own Google Scholar alerts:

Two Ways to Create Google Scholar Alerts
https://www.youtube.com/watch?v=o3U30CSUnMI

Once you have a Google Scholar Alert created, you will receive email notifications about new research on the topic(s) you selected. This strategy will help you find relevant research. ■

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42ND ANNUAL CONFERENCE
OCTOBER 22-25, 2024

Pre Conference Workshops: Monday and Tuesday, October 21-22, 2024

DoubleTree by Hilton Hotel Bloomington

Reservations can be made by contacting the hotel directly, or booking online using the links provided below. Refer to the "Closing The Gap Conference" when making reservation to receive conference room discounts when and where applicable.

Accessibility – The hotel offers a limited number of handicapped accessible rooms. If you require an accessible room, state your needs when making your reservation and reserve early to better insure a room that will best accommodate your needs. Learn more.

PLAN NOW TO JOIN US IN 2024!

Join us for the 42nd Annual Closing The Gap Conference and return home with knowledge and tools to implement all that is gained!
Through shared best practices and research, networking, training, hands-on opportunities and an expansive exhibit hall, conference participants will find information, strategies and products that prove beneficial and, oftentimes, unsurpassed for use in their work and in their lives.

WHO SHOULD ATTEND?

Anyone interested in finding practical and readily available AT solutions for ALL disabilities, mild to significant, infant through adult.

- ✔ SPEECH LANGUAGE PATHOLOGISTS
- ✔ OCCUPATIONAL THERAPISTS
- ✔ AT CONSULTANTS
- ✔ TECHNOLOGY SPECIALISTS
- ✔ AUTISM SPECIALISTS
- ✔ SPECIAL EDUCATORS
- ✔ UNIVERSITY INSTRUCTORS
- ✔ ADMINISTRATORS
- ✔ PHYSICAL THERAPISTS
- ✔ USERS OF AT
- ✔ VISION SPECIALISTS
- ✔ PARENTS

This year's conference will build on a tradition of providing a comprehensive examination of the most current uses of technology by persons with disabilities and the professionals who work with them.

Topics will cover a broad spectrum of technology as it is being applied to all disabilities and age groups in education, rehabilitation, vocation, and independent living.

Come and learn, first-hand, about the best AT products, practices and strategies used by teachers, therapists, clinicians, parents and end users alike.

REGISTER NOW!

he Gap 2024
RENCE
NNEAPOLIS, MN
Pre Conference Workshops: Oct. 21-22

Pre Conference Workshops
Monday and Tuesday, October 21-22 2024

IN-DEPTH LEARNING Pre conference workshops focus on assistive technology implementation and best practices. Each workshop is conducted by a nationally recognized leader in the field, providing in-depth professional skills necessary to successfully implement assistive technology in the lives of persons with disabilities. Workshops range from introductory to advanced and cover many different topics.

VIEW WORKSHOPS

Call For Proposals

Share Your Knowledge and Expertise

Closing The Gap will consider proposals for one-hour, multiple-hour or poster sessions that describe and/or demonstrate successful applications of assistive technology for persons with disabilities.

Groups or individuals who wish to participate should submit their proposals as soon as possible.

SUBMIT PROPOSAL

AT Maker Event
Call for Participation

For those interested in becoming more involved in the AT maker event, this is an opportunity to showcase exciting new creations, tools, and materials for making A.T. and to learn from the AT maker community.

LEARN MORE

Proposal Deadline is May 1, 2024

This Little Light of Mine

A Collaborative Approach in Developing Adapted Music Curriculum with Assistive Technology for Children with Complex Needs in Various Settings

Summary: This article is a collaborative effort of Little Light House and GNmusic therapy to emphasize access to music for children with special needs through neurological music therapy and use of assistive technology. A case study of a LLH alumni student will detail the collaboration of multiple disciplines within various agencies and the implementation of strategies across all environments.

INTRODUCTION

Music is proven to positively effect a child's learning by providing an enriching, multi-sensory experience (Dumont, 2017). Neurological Music Therapy (NMT) is defined as the therapeutic application of music to cognitive, affective, sensory, language, and motor dysfunctions caused by neurologic disease of the human nervous system (Thaut & Hoemburg, 2014). NMT is a research-guided clinical system, driven by neuroscientific advances. NMT is based on understanding the perception, cognition, and production of music, and how music influences and changes the non-musical brain and behavior functions. Children with developmental disabilities process information in unique ways, and music therapy provides therapists with engaging, highly motivating interventions that increase the child's attention, participation, and social interaction (Stanutz, Wapnick, & Burak, 2014). Other research indicates that weekly music therapy can improve speech and language skills in children with Autism and Developmental Disabilities (Mendelson et al, 2016). Additionally, children with developmental disabilities benefit from routines that provide reliability and predictability. When team members collaborate by using consistent routines and familiar strategies, the child's engagement will expand. Team members working together create effective, consistent, and sustainable interventions for the child that expand across all environments (Bricker, Felimban, Stengena, & Storie, 2022).

SAMANTHA NOSSAMAN, MMT, LPMT-BC, NMT-F Samantha provides services for individuals of all ages with developmental, neurologic, psychiatric, and geriatric disorders. She has over 5 years' experience as a music therapist, and over 4 years' experience as a neurologic music therapist. She is the current clinical training coordinator & supervisor for the ORU Music Therapy Program and the current clinic coordinator and internship director at the ORU Music Therapy Clinic. GNmusictherapy@gmail.com

MINDY CASH, B.S. Special Education and ATP Mindy has 21 years of teaching experience in home, school, and hospital settings by providing services to children age's birth to 18 whose diagnoses included, but not limited to cerebral palsy, neuromuscular disorders, brain injury, stroke, spinal cord injury, genetic disorders, severe epilepsy, chronic lung conditions, etc. Her greatest desire is to provide optimal and appropriate educational opportunities for children with complex medical, cognitive, physical, and emotional needs. As an Assistive Technology Professional, she is driven to find new and exciting technology to help children with physical challenges to access the world around them. Mcash@littlelighthouse.org

LYNDA CROUCH, CLVT/ATP, MOT, OTR/L Over 33 years serving children and adults with special needs with specialty within vision impairments/blindness/cortical vision impairment and assistive technology. "I'm honored to Glorify God through serving children with special needs and families at the Little Light House in Tulsa, OK Lcrouch@littlelighthouse.org

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Little Light House (LLH) is a Christian developmental center for children with special needs ages 0-6 years old in Tulsa, Oklahoma. The mission of Little Light House is to glorify God by improving the quality of life for children with special needs, their families, and their communities. We accomplish this by providing tuition-free education and therapy services to roughly 250 children with special needs and their families. Using our Bible-based curriculum, we incorporate Occupational, Physical, Speech, and Vision Therapy, as well as medical, orientation and mobility, and Assistive Technology support into every child's learning time. Additionally, LLH provides free, professional courses through an online Academy at www.littlelighthouseacademy.org.

Grace Notes Music Therapy, PC

For the past 5 years, LLH has partnered with Oral Roberts University (ORU) to include music therapy services for our students through annual group sessions in LLH classrooms. ORU students also completed their music therapy clinical training hours during this time. Grace Notes Music Therapy is a private clinic founded by the clinical training coordinator of the ORU Music Therapy Program, Samantha Nossaman. Nossaman serves as a Neurologic Music Therapy Fellow within the music therapy field and has had experience in various populations that include children and adolescents with intellectual, neurological, developmental, and behavioral disabilities. For more information about music therapy and the individuals Grace Notes MT serves, please visit: GNMusicTherapy.com or email Samantha at GNMusicTherapy@gmail.com

Through 50+ years of experience, Little Light House developed an assessment tool that tracks student growth and development in fourteen domains. This assessment measures student progress rather unlike deficit-based standardized assessments. This tool is called the Student Growth Indicator (SGI). See an example of our music goals below.

Knowledge of colors	Explores colors	Matches colors	Identifies colors	Finds colors in environment	Names colors	Identifies color words
Knowledge of shapes	Explores shapes	Matches shapes	Identifies shapes	Names shapes	Sorts objects by shapes	Draws shapes
Knowledge of musical concepts I	Listens to music	Responds to music	Makes a song choice	Sing songs spontaneously	Sing songs spontaneously	Imitates dance moves
Knowledge of musical concepts II	Moves body to music	Moves body rhythmically to music	Explores musical instruments	Uses musical instruments appropriately	Imitates a rhythm	Creates a rhythm pattern
Engages in dramatic play with others	Observes pretend play	Imitates pretend play	Spontaneous solo pretend play	Pretend play with others	Leads others in pretend play	Acts out Bible story
Music/ Creative Arts with Adaptive Learning materials	Explores instruments or sounds with adapted learning materials	Repeats musical sounds	Discovers more than one sound or instrument	Plays with both sounds	Plays with sound/ instruments with different body parts	Participate in group music with different sounds/ instruments (e.g. switches, adapted instruments, PVC frames/ pegboard, etc.)

Grace Notes Music Therapy also uses a strengths-based clinical assessment. This assessment measures five domains of function: cognitive and academic, sensorimotor, speech/ language and communication, social and emotional, and musical. Each assessment session is designed to assess the current ability of the individual within a musical setting. Below is an example of the cognitive and academic portion of the Grace Notes Music Therapy assessment.

Attention (5=Ample; 4=Moderate; 3=Some; 2=Minimal; 1=Scarce; NA=Not Applicable)

		comments
Identifying Sound Source	❑5 ❑4❑3 ❑2❑1❑NA	
Following Single-Step	❑5 ❑4❑3 ❑2❑1❑NA	
Directions	❑5 ❑4❑3 ❑2❑1❑NA	

Following Multi-Step	❑5 ❑4❑3 ❑2❑1 ❑NA	
Selective Attention	❑5 ❑4❑3 ❑2❑1 ❑NA	
Alternating Attention	❑5 ❑4❑3 ❑2❑1 ❑NA	
Divided Attention	❑5 ❑4❑3 ❑2❑1 ❑NA	

Memory (5=Ample; 4=Moderate; 3=Some; 2=Minimal; 1=Scarce; NA=Not Applicable)

		comments
Short-Term	❑5 ❑4❑3 ❑2❑1 ❑NA	
Long-Term	❑5 ❑4❑3 ❑2❑1 ❑NA	
Working	❑5 ❑4❑3 ❑2❑1 ❑NA	

Sequencing (5=Ample; 4=Moderate; 3=Some; 2=Minimal; 1=Scarce; NA=Not Applicable)

		comments
Sequencing 2- units	❑5 ❑4❑3 ❑2❑1 ❑NA	
Sequencing 3-units	❑5 ❑4❑3 ❑2❑1 ❑NA	
Sequencing 4 + units	❑5 ❑4❑3 ❑2❑1 ❑NA	

Executive Functioning (5=Ample; 4=Moderate; 3=Some; 2=Minimal; 1=Scarce; NA=Not Applicable)

		comments
Impluse Control	❑5 ❑4❑3 ❑2❑1 ❑NA	
Flexible Thinking	❑5 ❑4❑3 ❑2❑1 ❑NA	
Self-Monitoring	❑5 ❑4❑3 ❑2❑1 ❑NA	
Planning/Prioritizing	❑5 ❑4❑3 ❑2❑1 ❑NA	
Task Initiation	❑5 ❑4❑3 ❑2❑1 ❑NA	
Alternating Attention	❑5 ❑4❑3 ❑2❑1 ❑NA	
Abstract Thinking	❑5 ❑4❑3 ❑2❑1 ❑NA	

Please Define: ❑At grade level ❑Below grade level ❑Above grade level

Grade Level: Click or tap here to enter text.

Academic (5=Ample; 4=Moderate; 3=Some; 2=Minimal; 1=Scarce; NA=Not Applicable)

		comments
Reading	❑5 ❑4❑3 ❑2❑1 ❑NA	
Writing	❑5 ❑4❑3 ❑2❑1 ❑NA	
Object identification	❑5 ❑4❑3 ❑2❑1 ❑NA	
Object Descriptors (colors, shapes, sizes, etc)	❑5 ❑4❑3 ❑2❑1 ❑NA	
Numbers	❑5 ❑4❑3 ❑2❑1 ❑NA	
Currency Comprehension	❑5 ❑4❑3 ❑2❑1 ❑NA	

MUSIC THROUGHOUT THE SCHOOL DAY

Under the Individuals with Disabilities Education Act (IDEA), music therapy is considered a related service and can be requested by the child's school team to be necessary for a child to benefit from special education. Finding a qualified music therapist in your area and requesting a music therapy assessment specific to the child would be the first steps in qualifying a child for music therapy services. Based on an individualized music therapy assessment, the music therapist may recommend individual or group music therapy sessions to address the established IEP (Individualized Education Plan) goals. The music therapist then becomes part of the IEP team, collaborating with other teachers, aids, and therapists. It is recommended to help school teams understand more about music therapy and its significant value in assisting children in meeting their goals within the classroom setting.

Little Light House is blessed to rely on university students from a local music therapy program, volunteers, and teachers and therapists who incorporate music throughout the school day. Here is an example of a CVI activity created by a LLH teacher for a student who loves mariachi music. She used youtube video to incorporate his favorite CVI video along with the mariachi music to increase his engagement. This could also be used with a switch and switch interface with tarheel gameplay to encourage reaching and cause and effect with music.

Mariachi CVI created by LLH teacher for student.
https://www.youtube.com/watch?v=WpSlkkFXdgo

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Music Cart and Curriculum

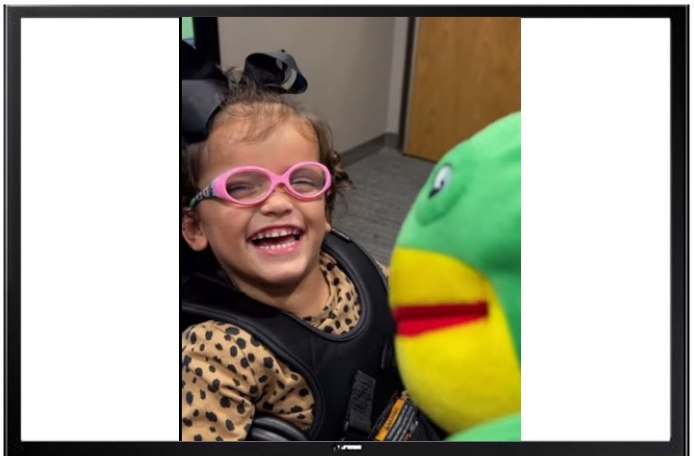
To further support teachers and therapists as they incorporate music into the school day, Mindy Cash created a music curriculum that supports the LLH bible curriculum and a music cart. The music cart contains musical instruments recommended by Samantha from Grace Notes, visuals for choice-making, and visual schedules to support student transitions. Teachers and therapists can check out the music cart, have access to an interactive slideshow for class use, and is provided with supplemental materials for ideas to use music in their classrooms or with therapy groups. The musical instruments were obtained through a grant for children with vision impairments through the local state Foundation for the Blind.

Music Cart.

MORE IDEAS FOR MUSIC IN THE CLASSROOM

Imitating using instruments.
https://www.youtube.com/watch?v=DDQcib2dhVw

Requesting more instrument using communication device.
https://www.youtube.com/watch?v=haaO8BpFQ7Y



Encouraging Voice.
https://www.youtube.com/watch?v=znYi9bRB2hw

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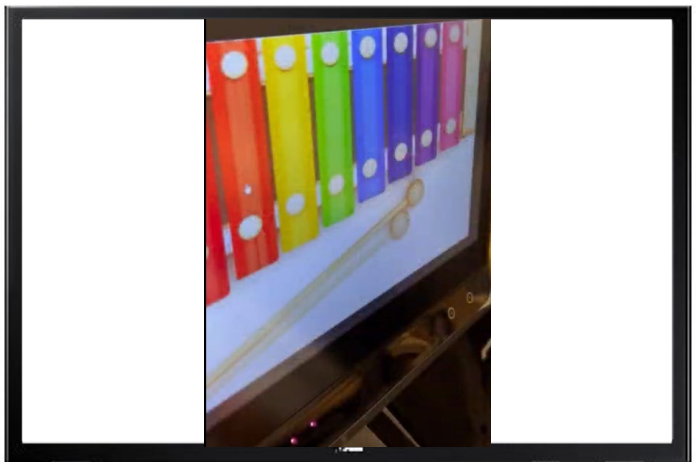
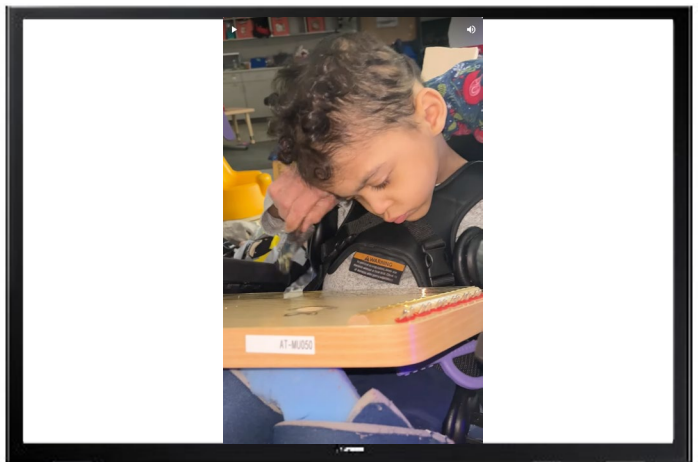
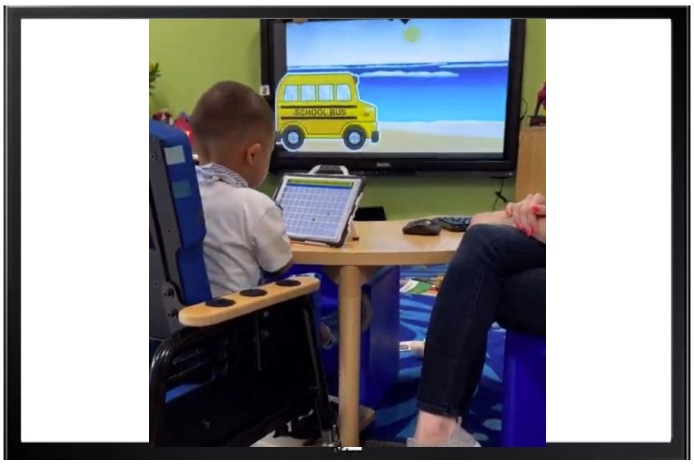


Using eye gaze technology to play instrument.
https://www.youtube.com/shorts/sGmiBybRAuI

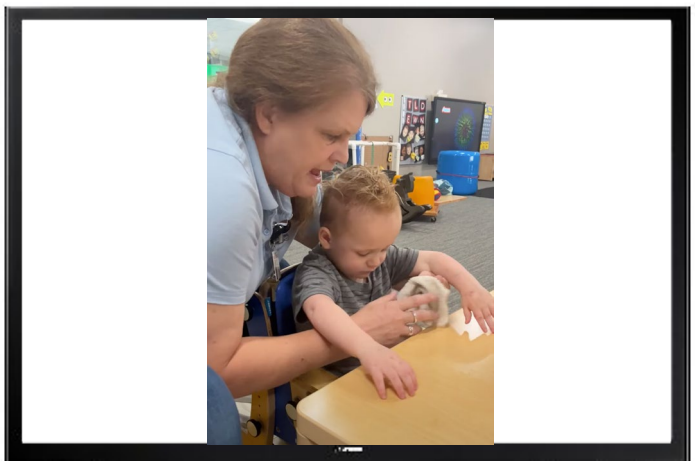


Exploring musical instruments with friends.
https://www.youtube.com/shorts/LkokWPCPDtg

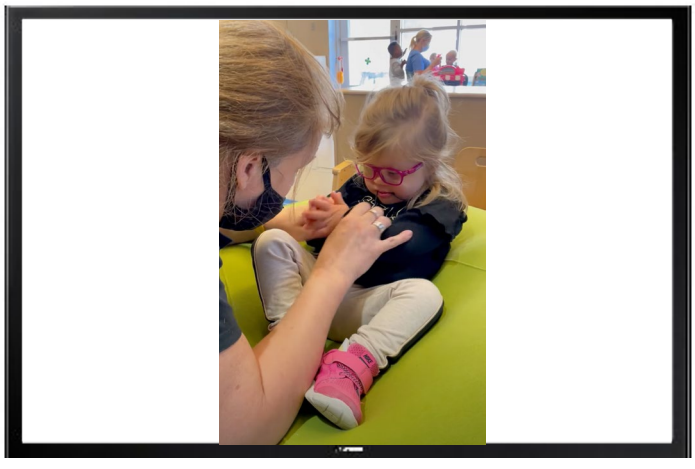


Requesting more music using communication device.
https://www.youtube.com/shorts/tkTQ95mcY0w

Turn taking Music with friend.
https://www.youtube.com/watch?v=0Khqf9m-p38



Transitions and routines.
https://www.youtube.com/watch?v=rm-0UTp4F8U



Song to encourage LLH student to wear glasses.
https://www.youtube.com/watch?v=uZxnDqNRnho

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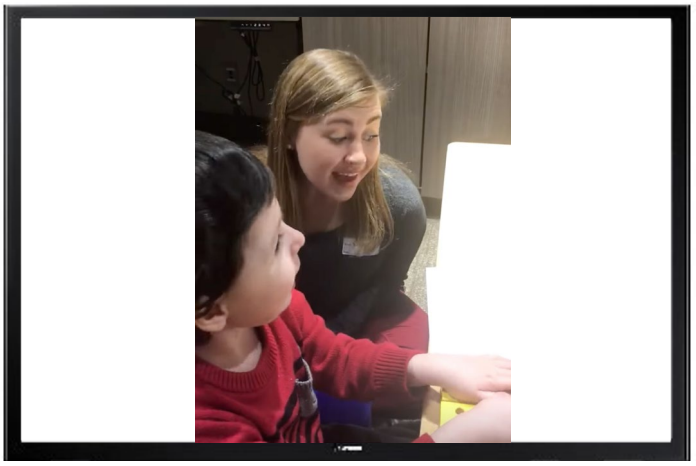
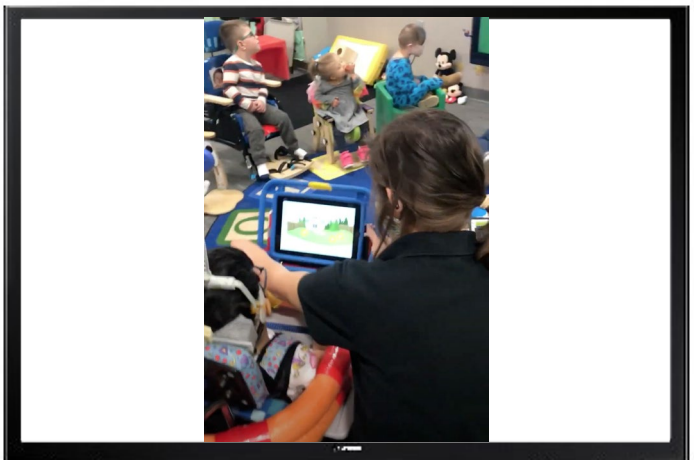
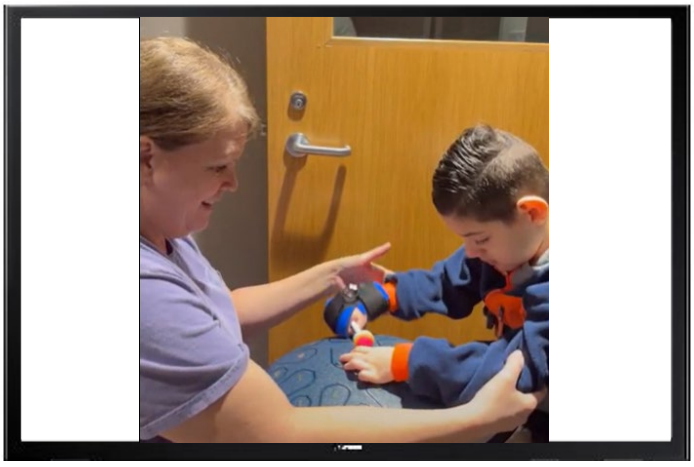


Learning songs about braille.
https://www.youtube.com/shorts/kesUPHf4pEo

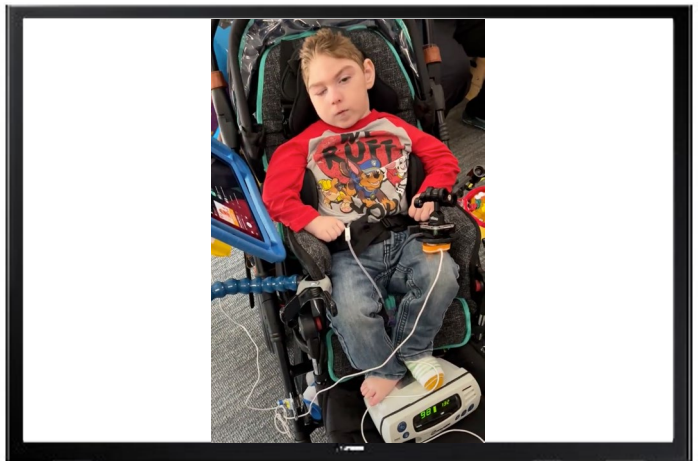
A music intern put these lyrics to a song she composed about the entire braille alphabet



Circle time with AT supports! VNC viewer, mogo mount, objects, LAMP with chatwrap, sign language.
https://www.youtube.com/watch?v=B1FBjBqBPSY



Hand splint and using both hands to play music.
https://www.youtube.com/shorts/kgNKSHbuzAE



Leisure skills with music.
https://www.youtube.com/watch?v=Ag38tasaxLU

Praise and Worship using a switch and drum.
https://www.youtube.com/watch?v=BWJZQUOEqvc

Praise and Worship.
https://www.youtube.com/shorts/kHNg5FdGSN4

Language and Literacy using a Song book

Assistive technology is more than tools! It is a service that includes collaboration and unique professional perspectives with a strategic selection of AT, outside-the-box thinking, and a coordinated plan. Team interconnectedness ensures that focus and unity remain on the child and their path to success and quality of life.

LET'S PUT IT ALL TOGETHER: MEET BUZZY

Buzzy is a former LLH student who's mom reached out for

additional information on how to support Buzzy and his school team. Buzzy is a 10 year-old, fraternal twin, with complex needs due to significant brain damage caused by a traumatic brain injury (TBI). He has limited words and is learning to use his 1000 Accent with VI version of LAMP. He has diagnoses of Cortical Vision Impairment and Hearing Impairment due to the TBI, and was receiving support from the state deafblind outreach coordinator for dual sensory loss of vision and hearing.

Buzzy exhibited self-injurious behaviors such as banging his head, scratching and biting himself, and inducing vomiting. His behaviors were escalating and affecting learning. Buzzy's mom, one of our LLH therapist, a music therapist, and the state Deafblind outreach coordinator believed that Buzzy's "behaviors" were attempts to self-regulate, communicate, and find consistency of expectations through routines.

Buzzy's school team set goals for being able to attend to activity for 20 seconds, stay engaged in play activity for more than 1-3 minutes, increase use of his right hand, and increase imitation of consonant sounds. In order to understand how to help Buzzy meet these goals and increase his participation, social interactions, hand development, and constructive play skills, the team needed more information of what Buzzy could do. They also needed ideas on , including consistent routines and repetition to support curriculum goals which included music intervention and Assistive Technology (AT) strategies and tools. Collaboration began with the team utilizing the SETT Framework (student, environment, tasks, and tools) to guide discussion and immediately begin decreasing self-injurious behaviors.

The following table contains various assessments and observations that were completed through team collaboration, parent interviews, observations and direct time. This information utilized for the "S" section of the SETT framework. The assessments were completed in school and home environments, and interviews during team meetings.

"S" for Student

What are the student's capabilities? What are the student's special needs? What are the functional areas of concern? Present level of achievement, results of evaluations, and student expectations.

What We Know:

History of seizures Fraternal twin Requires 24 hour supervision for safety Has limited social opportunities with peers Learning to use mobility cane Can go up and down stairs with a rail Cause and effect Sensorimotor state of development	Existing team: Buzzy, his family School team – therapists, psychologist Teacher, teacher assistant is training to be intervener, Deafblind outreach coordinator, LLH therapist for consults Need: music therapist trained in neurological music therapy

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What We Need to Know:

Assessment/Tool	Results	Future Assessment
Washington Sensory Disability Services form Microsoft Word - Web-Likes Dislikes(RevDec 12).doc (wa.gov)	Likes: Music and simple songs, vibration, pats on chest, Light, window play, heavy input swinging/jumping on trampoline, movement, silly noises, water, hugs, kisses, food, adapted bike, echo reverberating areas e.g. gym Dislikes: Complex, noisy environments, fast moving objects/people, waiting	Ongoing and update as new likes and dislikes discovered by team
CVI Range CVI Range Assessment – Christine Roman, PhD (cviresources.com)	Phase 2 Goal: Integrating vision with function	Green is preferred color Light is needed in all activities Movement very important Peripheral vision and poor visual motor integration Latency when fatigued Difficulty with sensory complexity and object complexity
Functional vision assessment	Lower visual field loss, right visual field loss, Close viewing distance.	Has glasses but would not wear them for long amounts of time
Hearing:	Loss of higher pitches in his right ear	Informal Functional Hearing Evaluation (IFHE) (nationaldb.org)
Dynamic Learning Circle Dynamic Learning Circle - Active Learning Space	Stage 1: A child becomes aware and is interested in : his/her own sensory or motor experiences objects in the environment people in the environment	Team goal of: Stage 2: A child becomes curious and interested which leads to: repetition experimentation exploration imitation establishing memories
Active Learning www.activelearning-space.org	Hand development Right hand: 6 months with raking Left hand: Can hold objects but does so with limited time before throwing, pick up small foods 10-12 months Constructive Play Skills Early Skills in all areas and lack of experience with objects/manipulation other than spoon and simple cause and effect vtech toys with pushing buttons. Hand development and constructive play skills	Due to TBI, right hand development poor and overall poor tool use with objects with left hand. Throws items often so "Hold everything" strategy incorporated Hold Everything strategy
Structured Teaching (TEACCH)	Structured Teaching Incorporates structure in environment and teaching strategies	Left to right work strategy Left- "to do or in Buzzy's case to explore" Middle- Work area Right- "All done" Due to CVI and TBI, Buzzy's awareness of spatial skills is very poor. This helps him to understand where he is in space and where items are in relation to him.
Sensory channels (auditory, visual, tactile, proprioceptive, vestibular, olfactory, gustatory, introceptive) Assistance with self regulation through co-regulation supports	Sensory avoidance of loud and complex environments Very motivated by olfactory, auditory with simple songs, music/sounds, proprioceptive and vestibular combined Sensory seeking for vestibular with movement and proprioceptive deep input e.g. patting on his chest, head banging, pinching, and patting surfaces.	Help team to understand co-regulation through a safe, predictable environment with routines and expectations. Emotional Regulation, Part Two: Using Co-regulation to Teach Emotional Regulation - Reframing Autism
Communication Matrix – free resource Assessment for children in determining communication skills and progression of goals	Uses 1000 Accent with VI LAMP version Limited vocabulary and due to cognitive impairments memory recall of these words is variable Eat, More, Buzzy, Bye, swing, go, bite, swim	Encourage team to complete: Home Page - Communication Matrix

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The SETT framework provided the team with a cohesive understanding of Buzzy's challenges for learning, and his needs for advancement towards goals. Because it was determined that he was mostly motivated by music, the team sought out additional information from a music therapist who specialized in pediatrics and neurological music therapy to gather additional assessment. The assessment was completed at his home, the school, and the music clinic so that all environments (E) are considered using the SETT framework.

Buzzy attended a 30-minute in-person music therapy assessment at the ORU Music Therapy Clinic. Buzzy was introduced to various instruments, including a tambourine, djembe, guitar, autoharp, chimes, jingle bells, and ocean drums. The music therapy assessment utilized each instrument in tandem with songs to assess Buzzy's sensorimotor, cognitive, communication, and social abilities. Results are shown below.

Domain	Results	Recommendations
Sensorimotor	The client was able to extend the dominant arm towards each instrument. The client was able to cross midline with minimal physical prompts. The client was able to strum fingers across the autoharp independently. The client was able to grasp an enlarged pick in his dominant hand independently while the MT guided his hand to strum the autoharp with his pick. The client remained seated on the bean bag during the entire session with one prompt to remain seated.	It is recommended the client continue working on crossing the midline with minimal prompts. It is recommended the client continue working on fine motor skills and grasping small items.
Cognitive	The client was able to sustain a prolonged period playing an instrument with minimal to no prompts. The client was able to stop and start playing an instrument independently given repetition and minimal prompting. The client engaged in parallel play on an instrument given no prompts. The client initiated reaching for a preferred item without prompts. The client imitated simple rhythms independently.	It is recommended to continue using music as a tool to increase sustained attention. It is recommended to continue using music as a tool to enhance alternating attention. It is recommended to use music and songs to enhance following one-step directions.
Communication	The client would verbalize one word given multiple prompts. The client remained mostly non-verbal throughout the session. The client used his hands to gesture/reach towards preferred items. The client imitated simple rhythms and took turns with the MT given repetition.	It is recommended to continue using songs and musical interventions to increase responses.
Social/Emotional	The client would turn his head towards the MT or the other therapist helping when addressed. The client displayed different forms of emotions through facial expressions throughout the session, such as smiling and furrowed brows. The client participated in parallel play, imitation, and sharing with the MT with minimal to no prompts.	It is recommended to use musical interventions to enhance socialization as well as turn taking, parallel play, and sharing.
Musical	The client appeared to enjoy the autoharp as evidence by his smile and continue strumming for approximately 5 minutes. The client appeared to enjoy the chimes as evidence by reaching out and strumming the chimes independently. The client appeared to enjoy simple songs such as "If You're Happy and You Know It" as evidence by smiling and playing his instrument without prompts.	It is recommended to use songs with I-IV-V chords and repetitive melodic lines.
Other	The client appeared to like sitting on the floor or bean bag chair.	N/A

Based on the results of the assessment, a collaboration of approaches and techniques to address the needs of Buzzy is recommended. Three primary techniques recommended include Auditory Perception Training (APT), Music Attention Control Training (MACT), and the use of the Iso-Principle through improvisation. That, 2014, defines APT as musical interventions that are used to identify and discriminate different components of sound, such as pitch, timbre, rhythm, time, and speech. MACT is a NMT technique uses music interventions to structure and organize information to increase attention, maintain attention, or alternate attention. The Iso-Principle is a technique used by music therapists to match the mood and energy of a client through music before gradually directing the client to the desired mood or energy level.

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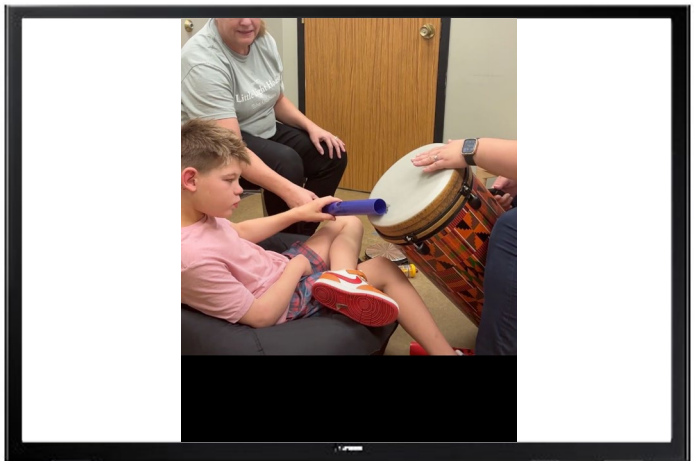
Home music assessment with team collaboration.
https://www.youtube.com/watch?v=-WnsA_Xx0nc

The music therapist attended an in-home music assessment and observation with the LLH team. During this assessment, the music therapist offered a new "hello" and "goodbye" song to let Buzzy know who was present. The music therapist also offered options to use his instruments to transition between activities and encourage socialization between the caretaker and Buzzy.

Learning to wait for his lunch at home .
https://www.youtube.com/watch?v=itpqXswR2wA&list=PLIsvFmoJaUynU32jT-t7ScmAWz5j3hwcO&index=10

This is a great example of a simple "waiting" song that provides rhythm and vibration with the chair for waiting, which can be difficult for children with complex needs. A simple, consistent rhythmic beat provides a temporal stimulus that helps facilitate entrainment and synchronization of physical movements. Evidence reveals that an individual may subconsciously time their motor movements to the auditory stimulus of the beat (Thaut, 2014). The music therapist provided a consistent rhythmic beat to which Buzzy can hear and feel, along with a well-known melody to help Buzzy focus on the musical stimulus instead of waiting for his meal.



Collaboration within music assessment at clinic.
https://www.youtube.com/watch?v=g_b4I0OdjeM

The video above is an example of collaborative session with Buzzy demonstrating a variety of skills through music! He demonstrates understanding loud versus soft, repeating sounds, pauses and anticipation of go, social interactions, tool use, increasing vocalizations with boom tubes, bilateral use of boom tubes, listening skills. The music therapist used songs with familiar melodies and simple rhythms to elicit responses from Buzzy. The music therapist also used different instruments to stimulate motor responses and increase attention.

Things the team learned:

- When engaging in musical play, rhythms, co-regulation with head compressions, and various musical instruments, Buzzy could attend for much longer than his goal of 1-3 minutes (up to 30 minutes during the assessment)!
- Helpful strategies for Buzzy include attaching items such as boom whackers to the drum (hold everything strategy – see resource section), using higher contrast, using light, and building up handles on tools.
- It is important to recognize Buzzy's hand development in the video above as it relates to constructive play skills. Initially, he used raking motions with hand, but through repetition with music and low-tech assistive technology, he learned to hold onto tools.

Children with severe/profound vision impairments are dependent on tactile skills (Smythe & Salt, 2022). Tactile skills are dependent on real-life experiences with objects and sensory information with repetition and over time. A child with severe/profound vision loss in addition to physical and cognitive impairments can still be relying on immature hand patterns similar to an infant. e.g. scratching with raking motion, pinching with immature grasp, swiping with batting motion, or stimming behaviors to gather information about their world. If passive learning encouraged e.g. hand over hand assistance with we use

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varible materials and activities, then the child's opportunities for learning are greatly diminished. The active dynamic learning circle is interrupted by these factors and the child can become dysregulated resulting in self-injurious behaviors or resorting back to immature hand patterns for communication e.g. scratching, batting (perceived as hitting) The dynamic learning circle emphasizes co-regulation and participation, not task completion.

In addition to the assessments for additional student information, the team discussed during the SETT meeting about Environments and Tasks/Routines before considering Tools. See below for these considerations.

"E" for Environments

Consider all environments	School: PE, music, classroom, hallway, cafeteria, art room, assembly, bathroom, playground Home: plays near window for light Eating set up at home Living room for listening to music Clinic: Assessment and future visits	• Having difficulty with hallway • Loves the gym and reverberation and music on speaker but having a hard time leaving the gym • Loves music but wants to leave music class due to complexity of music, passive listening
Materials	Uses iPad at home to listen to music and has iPad at school A few musical instruments but little auditory feedback	Music class: Limited access to musical instruments
Support for staff	Associate training for interventer Training for staff on AT tools	Intervener training and Deafblind modules online Open Hand Open Access Deafblind intervener modules
Access issues (technology, physical, instructional)	• Technology access varies due to internet • Needs physical help in exploring and using objects • access in gym varies depending on availability with large classes • Access in classroom is difficult if classroom is very loud or busy	He has difficulty retaining auditory cues and we strongly suspect that he forgets where he is transitioning to.

"T" for Tasks

Analysis of tasks with team indicated that tasks were inconsistent in materials, completion, and expectations. Team was so focused on controlling behaviors that they felt at a loss for tasks

Specific things that the student needs to be able to do to reach expectations and make progress	Increase participation across all school environments Decrease self injurious behaviors
The functional things that are a part of being actively involved in learning environments	Transition needs for anticipation and awareness of next activity
Communication	• Increased team meetings • Google docs to promote communication among team
Instruction with routines and mini routines	• Routine and mini routines were needed for structure and consistency • Predictability in materials and expectations • Type of instruction/cueing (frequency, auditory/tactile, amount of words, closer to him to bring verbal cue to forefront of environment. • Increase sensorimotor learning with access to objects
Participation	Incorporate his love of music and rhythm Increase access to music
Productivity	Structure explore area with left side "to explore", center explore area, and "done" on right side
Environmental Control	Auditory and visual complexity, consistent personal spaces in the room

"T" for Tools

What is needed to enable high participation?	Music with play with instruments for cause and effect and independent access to music
Accomodations and Modifications	Active Learning and low tech to build up handles, attach objects to musical instruments, set up area for structured learning
Diversified support/instructional strategies	Extra time for latency, simple short directions, repetition, consistency
Supports and services	Continue all services and proposal of adding music therapist
Training	Training by music therapist, continue to learn about active learning, cortical vision impairment, online deafblind modules, and associate completing intervener training.

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HAND DEVELOPMENT AND USE OF BOTH HANDS

PVC weighted windchimes DIY

The team worked together to create a musical instrument that would provide auditory and proprioceptive feedback, as well as encourage play and bilateral use of hands. They used PVC pipe to create a stand for wind chimes. The shiny metal and movement of the chimes support vision needs, and a mallet or other tool can be added to increase constructive play skills.

PVC pipe to create a stand for wind chimes.

INCREASE LEISURE SKILLS & TURN TAKING

Promoting access to customized spotify music list

https://www.youtube.com/watch?v=-t0SgoHGsiI

Because of Buzzy's communication impairment, he relied on unsafe behaviors like banging his head, to communicate that he wanted to change the song. To give him independent access to his customized playlist, the team made a cover for the ipad out of corregated plastic board (old political signs) covered with black duct tape, and cut out the area over the play button in the Spotify App. They also used orange contrast tape to outline iPad, yellow tape to outline the slot, and a green finger light to help him locate the play button. They also used the Guided Access tool in the iPad's accessibility settings so he could not exit the app. The team also added duct tape with velcro to create adjustable straps around the back of the iPad.

Cover for the ipad out of corregated plastic board. Also made duct tape with velcro to create adjustable straps around the back of the iPad.

TRANSITION AND ROUTINES

The team recognized that Buzzy was not processing verbal cues. He needed consistent use of objects that would provide sensory cues, helping him anticipate the next activity. The team also decided that he had difficulty with remembering where he was going throughout the day.

Simple and repetitive songs were paired with his daily activities, along with a portable object schedule. The object schedule consisted of Buzzy wearing a belt with a badge reel attached to each object that went with the components of his daily schedule. His paraprofessional at school would wear a fanny pack to carry the objects and easily change them throughout the day.

WALKING IN THE HALLWAY

Buzzy liked being in the hallway because of the echo when he yelled. The echo unfortunately reinforced him yelling and disrupting classrooms. To help with this sensory need, Samantha recommended they use a metronome app. The rhythmical sound would provide the auditory input that he sought in the hallway, encourage the use of his mobility cane, and pair the sound as an anticipation cue for "time to walk". The metronome click prompted him to find his cane when it was time to leave an area when that activity was over, and help him walk to the next environment.

Buzzy liked being in the hallway because of the echo when he yelled.

SOCIAL GREETINGS

To increase Buzzy's social interactions with others, the team recommended the use of songs to teach social greetings.

- Hello song
- Bye Bye song

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Constructive Play Skills/Active Learning.

To help Buzzy reach his goals of participating in activities/ tasks for more than 3 minutes, the team implemented use of a resonance board with structed teaching: left green "explore" box of musical instruments, explore area in the middle, and red bucket for "all done" exploring. This promotes routines, consistency, expectations and co-regulation

Simple Songs

If You're Happy & You Know it
If you're happy and you know it…
1. Tap the drum
2. Pat your legs
3. Clap your hands
4. Play the castanets

Gather Around the Drum

Gather 'round the drum Gather 'round the drum
Listen to my music Gather 'round the drum
Buzzy play the drum Buzzy play the drum
Listen to his music Buzzy play the drum

A Transition Song (Farmer & The Dell)

Walking down the hall Walking down the hall Listen to the beat we play Walking down the hall

SUGGESTED INDIVIDUALIZED EDUCATION PROGRAM (IEP) GOALS

Pre-Literacy/Pre-writing

- Left to right awareness
- Spelling B,U,Z,Z,Y
- Holding utensil/tool Song book

Math

- Repeat patterns
- Sort by shapes & sizes
- Counting with anticipation of activity 1,2,3

Science

- Explore textures of instruments
- Explore how instruments work
- Exploring different sounds of instruments
- Exploring echo of instruments

Outcomes

- Staying in music class longer with varied instruments
- Transitions are becoming easier due to routine of predictability and team is looking at a calendar system with the objects that he has learned are associated with activities of his day.

Buzzy saying B for Bye to his friends at school assembly.

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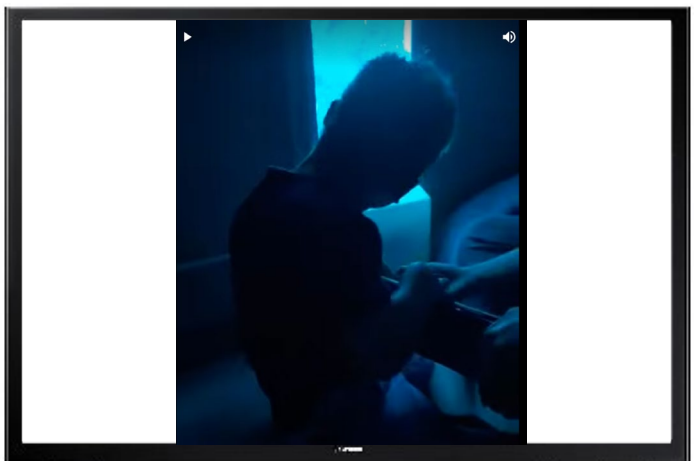
Learning to spell my name and repeating patterns - B..U..ZZ..Y
https://www.youtube.com/shorts/LmZKtWuU5SU



Buzzy singing while playing his guitar
https://www.youtube.com/shorts/8177J-aJpLI
Learning to hold an object with two hands, increase use of his right hand, and increasing vocalizations with CVI support.

RESOURCES FOR ADAPTED MUSICAL INSTRUMENTS AND ASSISTIVE TECHNOLOGY SUPPORTS

- MakeyMakey with piano for fruit piano https://makeymakey.com/
- Enabling Devices https://enablingdevices.com/product-category/adapted-toys-games/adapted-musical-instruments/
- Special Needs Toys https://specialneedstoys.com/usa/auditory/musical-instruments
- Active hands splints https://www.activehands.com/product/general-purpose-gripping-aid/
- Chrome music lab- FREE and lots of activities! https://musiclab.chromeexperiments.com/
- ThumbJam app for iPad- could use with switch and recipe
- Spotify custom music list with blue2 and switch and recipe
- How to create a recipe: https://www.ablenetinc.com/content/html/Downloads/Switch_Downloads/ios_13_recipes.pdf
- Hold Everything: https://www.ohiodeafblind.com/wp-content/uploads/2022/04/Hold-Everything-WEB-ready-060122.pdf
- Handouts from our CTG presentation

GENERAL RESOURCES

Resources for more information on LLH Academy classes: Homepage | Little Light House Academy

The Academy of Neurologic Music Therapy: https://nmtacademy.co/find-an-nmt/

American Music Therapy Association: www.musictherapy.org or https://netforum.avectra.com/eweb/DynamicPage.aspx?Site=amta2&WebCode=IndSearch

Association of Assistive Technology Act Programs: https://ataporg.org/

State Deaf-Blind Projects : https://www.nationaldb.org/state-deaf-blind-projects/

OKLAHOMA FUNDING RESOURCES

The Oklahoma Foundation for the Education Blind Children and Youth (Grant)

Tulsa Cerebral Palsy Association

Boy scout (Eagle projects)

Tuesday Morning Miracle Workers (volunteer subgroup of Habitat for Humanity)

SSI/DCP (Disabled children's program)

AIM (Accessible Instructional Materials) through Oklahoma Library for the Blind

Lion's club

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Skills for Life:

Student-Centered Strategies for Executive Function

Summary: Do your students struggle to focus in class? Do they have trouble getting assignments turned in on time? Is their backpack or locker a mess? They might be struggling with executive function. This article will review the latest research about executive function and how deficits in executive functioning impact students. Using videos, websites, and strategies, the authors will demonstrate effective tools for self management, time management, materials management, and information management.

INTRODUCTION

Imagine a scenario in which a teacher designs a student-led project for the classroom "dinosaur exhibit". Each student has 2 weeks to choose a dinosaur, research facts about it, and create a presentation to share with the class. Valencia loves dinosaurs and knows a lot about them; however, this project is frustrating to her. The choices (picking a dinosaur, gathering information, starting the presentation) seem overwhelming to her, causing her anxiety to escalate. Each option feels equally important and Valencia isn't sure where to begin. She spends so much time looking at pictures of dinosaurs that she is rushed to note the factual information. The posterboard she creates is messy looking and the information is not presented in a sequential manner. Her presentation is not an accurate reflection of her knowledge of the content. It appears that Valencia has difficulty with her executive function skills.

WHAT IS EXECUTIVE FUNCTION?

So, what exactly is executive function (EF)? There are many definitions and ideas of what constitutes executive function. For

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LINDA DOEHLE started her career as a software engineer after completing her degrees in Computer Science and Mathematics at Whitworth College. She brought her technical skills to the field of assistive technology while working as an Assistive Technology Specialist for the Yakima School District. Linda holds an AT Specialist Certificate and enjoys being able to use her technology skills in helping students optimize their abilities using assistive technology. Linda has been with the Special Education Technology Center for ten years and has presented webinars and classes at national and statewide conferences.

NATALIE NEWMAN, MOT, OTR/L, is the Director of the Ershig Assistive Technology Resource Center at Western Washington University in Bellingham, WA. Prior to her work at WWU, she worked in the public school setting as an Occupational Therapist and Assistive Technology Coordinator working with Gen Ed and SPED teachers to implement UDL/AT supports for all students. Natalie loves the hope and possibility she sees in the eyes of someone when she shows them a support tool that will make a difference for them.

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this article's purposes, we will consider the following:

- Executive function is the self-management system of the brain. It allows us to organize and plan, focus and shift focus, and manage emotions, among other important tasks (Brown, 2023)
- Executive function is a set of processes that all have to do with managing oneself and one's resources in order to achieve a goal (Smart but Scattered Kids); it is an umbrella term for the neurologically based skills involving mental control and self-regulation to effectively execute (perform) tasks and solve problems.

While EF is an umbrella term, it can actually be broken down into specific cognitive components that are required in order for us to be organized, self-regulated, and adjust to things that we encounter throughout our daily lives. Much research has been done on this topic of executive function and ADHD with the works of Russell Barkley and Thomas Brown being well known and highly regarded.

Russell Barkley, Ph.D. maintains the following cognitive process make up executive function:

1. Inhibition
2. Resistance to distraction
3. Self-awareness
4. Working memory
5. Emotional self control
6. Self-motivation

Dr. Barkley's research is based on the idea that the inability to self-regulate is the root cause of many challenges faced by individuals with ADHD (Barkley, 2011).

Thomas Brown, Ph.D. describes executive function as a complex system comprising 6 aspects or clusters (Brown, 2008).

- **Activation:** Organizing, prioritizing and activating for tasks
- **Focus:** Sustaining and shifting attention to task
- **Effort:** Regulating alertness, sustaining effort and processing speed
- **Emotion:** Managing frustration and modulating emotions
- **Memory:** Utilizing working memory and accessing recall
- **Action:** Monitoring and self-regulating action

Dr. Brown's research indicates that these clusters operate in a coordinated way, and people with ADHD tend to have impairments in at least some aspects of each cluster.

Both Dr. Barkley and Dr. Brown indicate that EF difficulty stems from an **inability** to regulate or manage one or more cognitive operations. So, what do we do to help those who have challenges with EF? We teach them! Throughout this article, you will find resources, strategies, and tools that you can use to support the executive function of the students with whom you work.

Horizontal picture of shadow people indicating one's lifespan as babies to children to adults to an older person in a rocking chair.

It is important to note executive function is a lifelong process. It is easy to consider young children not having developed EF skills. They often need guidance to prioritize or organize tasks, transition between activities, and self-regulate their emotional responses. When you think through the aging process, older adults often have similar needs. While the expectation that older students and adults in the workforce can manage themselves, many, like those with ADHD, struggle with EF processes their whole life. And all of us have times (often when we are under a lot of stress) when we rely more on external supports to manage EF.

A general consideration for addressing EF difficulties is to externalize the processes you want students to internalize (Barkley, 2011). Using one or more of the following practices can help students understand EF and begin to fine tune EF skills for themselves.

1. Model - explain your own thought processes and steps. Verbalize what you are thinking and why.
2. Make external everything you want your student to internalize - provide visuals in the general space and individually if necessary
3. Be explicit- offer step-by-step details or instructions rather than only give the broad idea
4. Break tasks into smaller pieces and offer due dates if a longer project
5. Provide structure/framework like manipulatives, graphic organizers, storyboards, etc.
6. Practice/demonstrate in context in real time.

Universal Design for Learning (UDL) offers additional considerations to support the development of EF skills. UDL is a framework that removes barriers to student learning and honors learner variability by allowing multiple ways for students to engage in learning, receive information, and express what they know.

The UDL Guidelines (CAST, 2018) specifically identify Executive Functions under the Action and Expression principle as a method to internalize learning. Educators can support executive functions by providing options for appropriate goal setting, planning and strategy development, managing information and resources, and progress monitoring.

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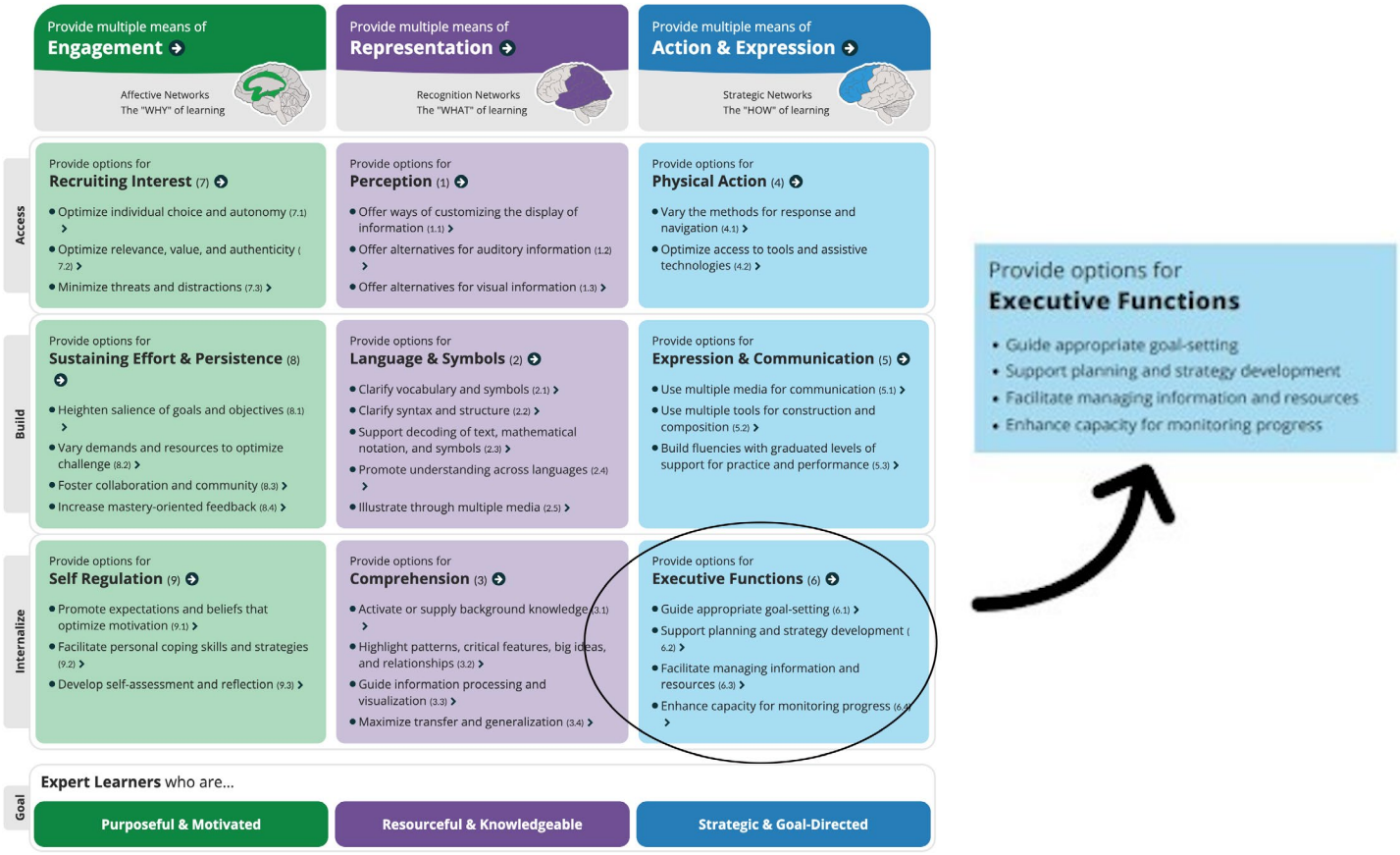

Universal Design for Learning guidelines table with emphasis on Executive Function.

Executive Function skills are essential for students to become expert learners who are strategic and goal directed. Options listed in the UDL framework empower students to take ownership of their own self-management, organization, and growth. Consider these factors when setting up EF options for your student: What are your students' strengths? What are their preferences? What are they interested in? What motivates them?

These general considerations can be offered in a variety of settings and modified to match certain age groups, grade levels, and environments. However, there are specific tools and resources that can be helpful as educational interventions specifically relating to self management, time management, information management, and materials management.

SELF MANAGEMENT

How do students take care of their bodies and minds in order to engage in learning? How does regulating emotions help them stay focused and calm? What routines and strategies help them plan and set priorities for their daily schedules and task lists? Students who struggle in this area may get easily overwhelmed, have behavior outbursts or become easily distracted.

Self management is a critical element of executive functioning that can make a positive difference in student performance and outcomes. When bodies and emotions are regulated and daily routines create predictability, the stage is set to maximize learning. According to the Fairfax County Public Schools Assistive Technology and Executive Functioning Page, "Self-management skills are the mental processes that enable us to plan, set priorities and resist impulsive actions or responses. A student needs to sort through a constant stream of sensory information and needs to employ self-regulation strategies to monitor and regulate one's thinking, attention, behavior, emotions, and social interactions."

Students who struggle in this area may benefit from tools and strategies that support self regulation such as visual schedules, social stories, movement, and engagement.

SELF-REGULATION

Student choice is an important aspect of addressing self-regulation. The Zones of Regulation is an instructional program with engaging visuals that educators can use to teach students self-regulation skills. The program offers a color-coded self-evaluation scale where students rate their emotions and then choose from a menu of activities to regulate their emotions to the just right level for learning. The Zones of Regulation App Bundle is a supplemental digital tool which uses a game format to teach the foundational concepts of the program.

Students can also create their own choice board from scratch.

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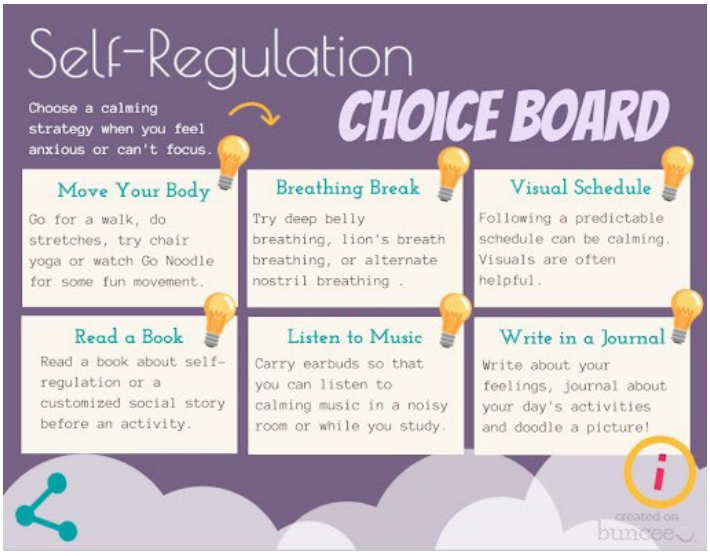
Students can include their preferred activities of self-regulation such as going for a walk, deep breathing, referring to a picture schedule, reading a book or social story, listening to calming music, or writing about their feelings in a journal. Buncee is a great digital tool for creating a choice board.



Self Regulation Choice Board created in Buncee app.

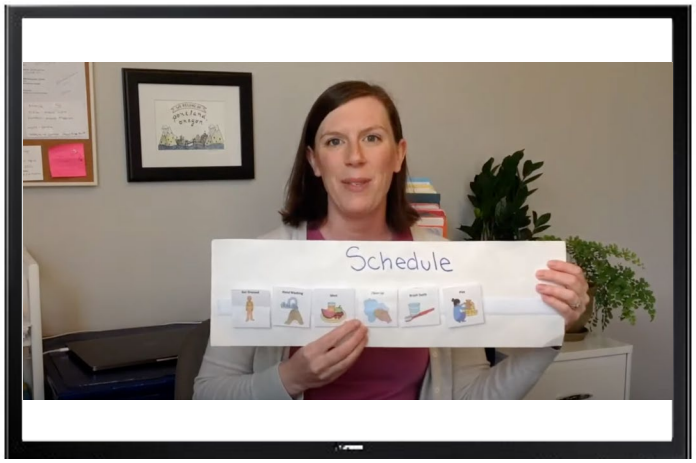
VISUAL SCHEDULES

A visual schedule communicates the sequence of upcoming activities or events through the use of objects, photographs, icons or words. (Hume, 2024), When students feel anxious or upset, providing visual schedules gives them predictable schedules and structure during their school day. Visuals are effective in helping students regulate their emotions and engage successfully in learning activities. LessonPix is a website that provides an easy tool to create and print visuals in the classroom for student schedules, classroom games, choice boards and more.

For examples of how to incorporate visual schedules in the classroom and at home, watch the video Teaching and Using Visual Schedules. Visual schedules can be used for school day schedules, following steps of a task, as well as morning and evening routines at home. Visual schedules are especially effective for students with Autism Spectrum Disorder (ASD).

SOCIAL STORIES

Students often have difficulty when routines change at home or school. They may need to relearn expectations, become familiar with a new sequence of events or get to know a new staff person. Using social stories is a great way to prepare students for successfully navigating these changes. This video describes and illustrates how to create social stories for new routines. Using Social Stories for New Routines.



Teaching and Using Visual Schedules.
https://www.youtube.com/watch?v=iJvBqR6B0VI

Using Social Stories for New Routines.
https://www.youtube.com/watch?v=7CdjxrQSD6w

Social stories can be created digitally and then be presented to students either digitally on a tablet/computer or printed out in paper books. One tool that is very useful for creating social stories on an iPad is Pictello App. Students who need alternative access can use 1 or 2 switches to turn the pages and listen to the story read back to them independently. Likewise, students can use their fingers to tap and swipe through the pages of the story.

MOVEMENT

Movement plays a critical role in preparing our brains for attention and learning. Educators should consider starting a lesson with a short movement activity before moving on to more focused work that requires intense attention, cognition or writing skills. The article and podcast To Boost Learning, Just Add Movement explains more about the connection of movement and learning.

Showing videos can be an easy way to provide fun and

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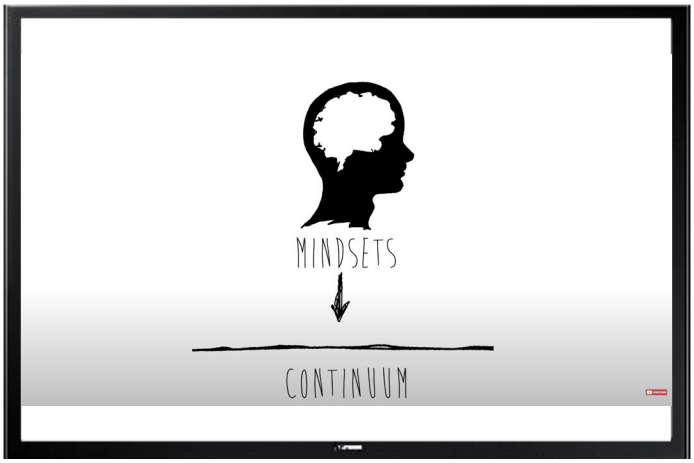
engaging movement activities to the whole class. Review these 20 Brain Break Videos to see examples of ready made movement activities that take little time and effort to set up and implement with your students.

ENGAGEMENT

The first principle of UDL, engagement, is a prerequisite for effective learning. According to Center for Applied Special Technologies (CAST), affect represents a crucial element to learning, and learners differ markedly in the ways which they can be engaged or motivated to learn...there is not one means of engagement that will be optimal for all learners in all contexts; providing multiple options for engagement is essential (CAST, 2018). If students are not interested in the content being presented or motivated by the instructional methods, they may become easily distracted, frustrated, or disengaged. Sometimes educators make assumptions about what a student is capable of and are stuck in a fixed mindset. A growth mindset is vital to helping students reach their potential. The video Growth Mindset vs Fixed Mindset may provide some new insights.



Growth Mindset vs Fixed Mindset.
https://youtu.be/M1CHPnZfFmU

An excellent way to engage and connect students of all abilities in your classroom is to set up Project Based Learning (PBL). PBL is a teaching method in which students learn by actively engaging in real-world and personally meaningful projects (Buck Institute of Education, 2024). PBL provides students opportunities to learn teamwork, participate in learning at their ability level, capitalize on their strengths and to engage in critical thinking about a complex issue.

See Table 1 for the previously mentioned tools/strategies as well as a few more. For a more accessible version of Table 1, refer to this EF Self Management Resource Document.

Category	Strategy/Tool	Description
Self Regulation	SETC Executive Functioning Website: Self Regulation	SETC's Executive Functioning website page highlighting self regulation tools and strategies
	5 Incredibly Fun Games to Teach Self Regulation	Video (7:53 min) by Kreative Leadership illustrating research proven games to teach self regulation to kids
	15+ Strategies to Help Build Self Regulation Skills	Article from Pathway 2 Success website describing self regulation and 15 strategies to use with learners
	Zones of Regulation Program	Website and paid self regulation program with book and digital materials
	Zones of Regulation App Bundle	Group of apps for an iPad to teach the 5 zones of regulation in a gamified approach
	Buncee	Website with digital tools for creating custom choice boards
Visual Schedules	Teaching and Using Visual Schedules	Video (8:55 min) showing how to use visuals schedules in the classroom and at home
	Visual Schedules in the School Setting	Article on structured teaching and visual schedules in the classroom
	LessonPix	Website to create printable low tech visuals
	ChoiceWorks App	App that provides visual choices for daily routines, emotions and behavior
Social Stories	Using Social Stories for New Routines	Video (2:57 min) by Edutopia talking about how social stories can support new routines
	Autism and Assistive Technology: Social Stories, Narratives, and Scripts	Video (13:54 min) by Mo Buti, expert on Autism
	Social Stories for Kids with Autism - The Ultimate Guide	Article offering a complete guide to using social stories with children who are autistic
	Print pre-made social stories from Autism Little Learners	Website by Autism Little Learners offering a variety of pre-made printable social stories.

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	Pictello App	App to create social stories that are switch accessible
Movement	Go Noodle Games	Video play list by Go Noodle with a variety of engaging movement games
	To Boost Learning, Just Add Movement	Article & Podcast about the benefits of movement to boost learning
	5 Strategies for Integrating Movement into Learning	Article on how to integrate physical activity into lesson planning
	Best Yoga Apps for Kids 2021	Article about best yoga apps for kids
Engagement	SETC Executive Functioning webpage highlighting tools for maintaining focus and attention	Webpage with strategies for maintaining focus and attention
	Growth Mindset vs Fixed Mindset	Video (2:19 min) by John Spencer describing a growth mindset versus a fixed mindset as it relates to learning
	Differentiating by Offering Choices	Article discussing how to differentiate learning by offering choices
	Project Based Learning	A website dedicated to educating others about project based learning
	Students: Getting Starting with Flip	Video (44 sec) by Flip describing Flip's versatile video response tool as a choice for students.

Table 1 - Executive Function Self Management Resources.

INFORMATION MANAGEMENT

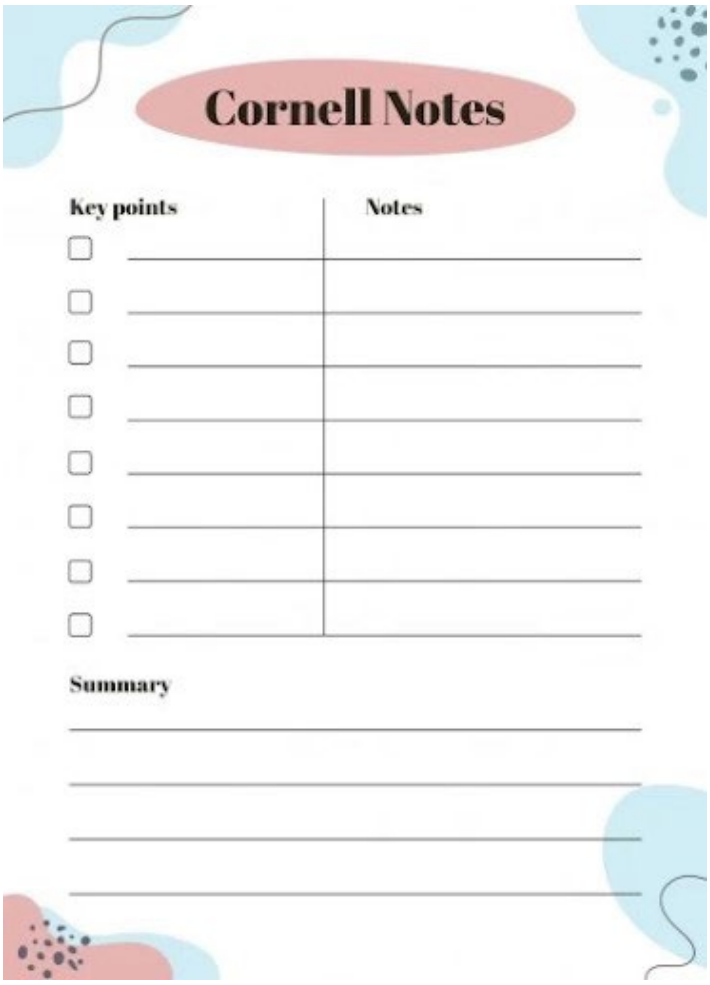
How do students store information both physically/digitally and mentally? How do they use the information effectively to produce a product such as an essay or complete an assignment? How do they decide the priority and steps to complete an assignment? Students who struggle in the area of information management may not know where to start or may get stuck on one step and not complete the others.

Information management includes how students receive information and what to do with that information to use it effectively. According to the Fairfax County Public Schools Assistive Technology and Executive Functioning Page, "Information management skills assess a student's ability to come up with the steps needed to reach a goal and to decide their order of importance. Students with weak planning and prioritizing skills may not know how to start planning a project, may be easily overwhelmed trying to break tasks into smaller, more manageable chunks, and they may have trouble seeing the main idea."

Students who struggle with information management may be helped by introducing them to systems and tools that organize information efficiently such as note taking, color coding, graphic organizers, and breaking down processes.

NOTE TAKING

Note taking is a critical skill for students to organize and understand the materials they are learning whether it be a lecture or reading assignment. Strategies for note taking can range from creating outlines to specific note taking strategies. Part of learning to effectively take notes is learning which method is most effective within the context the student is working. For example, outlines can help a student organize information for an essay and the Cornell note method may be more helpful when listening to a lecture. The website, Understood.org has an article with 5 Simple Strategies for Note Taking that is a great starting point.



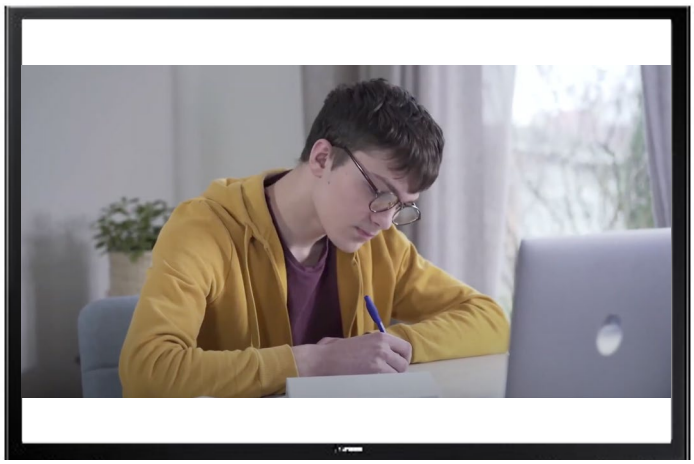
Blank Cornell note template.

COLOR CODING

Color coding can also be a helpful way for students to keep information organized into similar topics and subjects so they can keep the information sorted efficiently. This can help them when they go to retrieve the information so they don't need to go through all the information every time they need to use it. Two articles that give some specific color coding strategies are 7 Color-Coding Tips to Get Your Child Organized and Color Coding: The Differentiation Strategy You Never Knew You Needed.

GRAPHIC ORGANIZERS

Graphic organizers are a great method to sort information in a context specific manner that helps to track and visualize the information at a glance. Electronic graphic organizers have the added advantage of allowing the information to be links that take the students directly to more information that may be needed. It is helpful to teach students to use different types of graphic organizers depending on the information they need to synthesize. Creately blog has a resource list teachers and students can explore called The Ultimate List of Graphic Organizers for Teachers and Students. Tools for Life Georgia AT Program created a video, Using Graphic Organizers to Support Students with Disabilities, which demonstrates different graphic organizers with examples of how they can be used.



Using Graphic Organizers to Support Students with Disabilities.
https://www.youtube.com/watch?v=-zxM9kBH2EE

BREAKING DOWN PROCESSES (TASK ANALYSIS)

When considering how to use information efficiently in creating assignments and projects, task analysis is necessary. The assignment or project must be broken down into manageable pieces. Understood.org has an article called 6 Steps for Breaking Down Assignments to help students learn to do this. The Watson Institute has a video showing how to break up homework assignments which can be watched here: Visual Chunking: Homework.

See Table 2 for the previously mentioned tools/strategies as well as a few more. For a more accessible version of Table 2, refer to this EF Information Management Resource Document.

Category	Stragtegy/Tool	Description
Note Taking	SETC Executive Functioning web page: Note Taking	Website with Tools/Strategies and information on Executive Functioning
	How to Take Notes in Class: The Five Best Methods	Video (6:40 mins) by College Info Geek. Audience for video is college students but information is relevant for any student.
	5 Simple Strategies for Note Taking	Resource Sheet from Understood.org
	7 Most Efficient Note Taking Methods	Article by LifeHack.org
	Example: Cornell Notes Template available at gdoc.io	Consistent notetaking method with sections for lecture notes, key words & questions, and a summary
	How to Study Your Notes (Effectively Highlight and Color Code)	Video (5:17) geared toward older students by @Mister Messinger
	How assistive technology can help kids with note-taking	Article by Understood.org
Color Coding	School Tips and Organization: Color-Coding School Supplies and Subjects	Video (1:24 mins) by Understood.org
	Color Coding: The differentiation Strategy You Never Knew You Needed	Article discussing how teachers can color code content to help students understand and retain information better.
	7 Color-Coding Tips to Get Your Child Organized	Ideas for organization with color coding by Understood.org
	The Pros and Cons of Color-Coding Your Calendars	Article discussing color coding calendars. This is an option with any electronic calendar such as MS Outlook or Google Calendar.
Graphic Organizers	Using Graphic Organizers to Support Students with Disabilities	Video (2:53 mins) by Tools for Life Georgia AT Program
	The Ultimate List of Graphic Organizers for Teachers and Students	Resource sheet by Creatively blog

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	Google Drawings for Graphic Organizers	Document explaining uses for and how to create graphic organizers with Google Drawing by Eric Curts from Ctrl-Alt-Achieve
Note Taking	SETC Executive Functioning web page: Note Taking	Website with Tools/Strategies and information on Executive Functioning
	How to Take Notes in Class: The Five Best Methods	Video (6:40 mins) by College Info Geek. Audience for video is college students but information is relevant for any student.
	5 Simple Strategies for Note Taking	Resource Sheet from Understood.org
	7 Most Efficient Note Taking Methods	Article by LifeHack.org
	Graphic Organizers for Kids	Text based graphic organizers for different contexts available for download by Understood.org
	Popplet App	Example of a graphic organizer
Breaking Down Processes (Task Analysis)	Breaking Down Assignments and Tasks	Video (1:49 mins) by UMD ADHD
	6 Steps for Breaking Down Assignments	Article by Understood.org
	Visual Chunking: Homework	Video (1:53 mins) by The Watson Institute
	Assignment Calculator	Website that breaks down assignment into tasks and creates due dates for each task based on date assignment is due
Understanding/ Processing Written Information	Rewordify	Free online tool that simplifies text and has vocabulary building tools
	Text Compactor	Free online tool that summarizes text
Digital platforms to manage information	How to Organize your Google Drive Folders for School	Video (8:34 mins) from readingwritingtutor.com The ideas presented here work for Windows and Mac also.

Table 2 - Executive Function Information Management

TIME MANAGEMENT

How do we manage our time at home and at school or work? How do we monitor our progress on projects and task lists? People who struggle with this often miss due dates on tasks/assignments or are late for class or appointments.

Time management is a lifelong skill that makes a difference in managing assignments at school, keeping medical or business appointments, and maintaining healthy relationships by arriving at social functions with family and friends in a timely manner. According to the Fairfax County Public Schools Assistive Technology and Executive Functioning Page, "Time management skills are essential for a child's success at school. It allows a child to complete tasks in a timely manner. To have strong time management skills, a student should estimate the time necessary to finish tasks and make and follow a schedule. Time management involves a child monitoring their own effort and actions, having an appropriate sense of urgency to complete assignments, and having the ability to follow step-by-step procedures."

Students who struggle in this area may benefit from tools and strategies that target time management. We will share more information on specific resources including timers and reminders, schedules and to do lists, calendar tools, completing assignments and goal setting.

TIMERS/REMINDERS

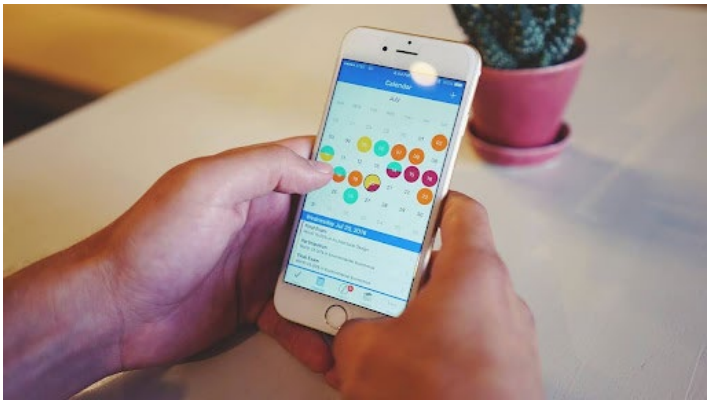
There are a variety of timers and reminders from low tech to high tech to support memory and behavior for students. On the low tech end, there are a variety of visual timers and counters that work well for students, some which can be customized to the learner's sound sensitivities for a higher success rate. Strategies for giving reminders complement the tools, as described in the article How to Give a Reminder that Improves Behavior. For high tech, Apple Reminders App or Reminders on Google Play are sophisticated apps with options for both voice and touch access to set up smart reminders. For more details on these features, watch Using Apple Reminders like a pro: 7 Features you need to know.

SCHEDULES/TO DO LISTS

Everyone depends on written lists such as post-its these days, as there are too many schedules and lists to remember! It's always wise to have a printed list when electronics are not easily accessible. Here's some creative ideas for Printable To Do Lists for Kids. When tablets or phones are available, apps such as Choiceworks App or Kids ToDo List come in handy for customizing lists and visual schedules. The Choiceworks App for Visual Schedules provides critical support for students to participate in home and school routines and improve behaviors such as staying calm and waiting.

Choiceworks: App for Visual Schedules.
https://youtu.be/tigXrKqXNVc?si=OQrJwDASBh5Ng66M

CALENDAR TOOLS



A cell phone being held in a person's hand with calendar app showing.

In today's world, students need to manage their time with either printed calendar planners or electronic calendars on their phone or computer to track daily activity schedules, study time, assignment due dates and important school or home events. In lieu of purchasing expensive planner books, one option is Printable Microsoft Calendar Templates to attach to a notebook, put in a folder or stack on a metal ring in a backpack. A higher tech option is to use the calendars built into their phones or computers such as Google Calendar. In this video, My Google Calendar System: Student Productivity and Time Management, a student talks about how she organizes her school and personal life with color coding and themed calendars.

COMPLETING ASSIGNMENTS/GOAL SETTING

Building self-direction skills helps students set goals and initiate steps for completing assignments in a timely manner. In an effort to improve student skills in self direction, the BEST group created a Self Direction Toolkit in 2020 that describes the components of self-direction and accompanying rubrics that guide self-direction assessment for various grade levels from Kindergarten through 12th grade. For older students in high school and college, assignment calculators guide students in this planning process. University of Minnesota's Assignment Calculator offers a web based system for calculating dues dates and breaking down assignments into manageable steps.

See Table 3 for the previously mentioned tools/strategies as well as a few more. For a more accessible version of Table 1, refer to this EF Time Management Resource Document

Category	Strategy/Tool	Description
Timers/Reminders	Using Apple Reminders like a pro: 7 Features you need to know	Video (8:57 min) highlighting 7 features of the Apple Reminders app
	How to Give a Reminder that Improves Behavior	Article outlining the steps for giving reminders that improve behavior
	Visual timers and counters	Webpage showing a variety of visual timers and counters to help parents and teachers with children with autism
	Apple Reminders App or Reminders on Google Play	Links to downloading Apple or Android Reminders apps
Schedules/To Do Lists	SETC Executive Functioning webpage highlighting Keeping Task Lists	Webpage on tools and strategies for keeping task lists
	Choiceworks App	Video (1:09) by StepUpAT Project on how to use the Choiceworks App
	Get More Done: Try These 10 Simple Tips for Better To-Do Lists	Article with tips for to-do lists
	Printable To Do Lists for Kids	Website that provides free printable to do list designed for kids
	Choiceworks App or Kids ToDo List (Apple and Google)	Create digital schedules and lists using these Apple or Android apps
	Kids ToDo List	Link to free Kids ToDo List app on the Appstore
	SETC Executive Functioning website page focused on Calendar Tools	Webpage focusing on calendar tools and strategies
	My Google Calendar System: Student Productivity and Time Management	Video (10:00) by a student showing how she stays organized with Google Calendar
	5 Reasons You Should Be Keeping a Calendar	Article from Cornerstone University

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	Printable Microsoft Calendar Templates	Website providing free printable calendar templates
	Visual Schedule Planner App	Video (10:05 min) narrated by a student on how she used Google Calendar System
Completing Assignments/ Goal Setting	SETC Executive Functioning webpage focused on completing assignments	Webpage focusing on tools and strategies for completing assignments
	Special Education Learning Tips for Visual Chunking Homework	Video (1:53) by the Watson Institute
	Self Direction Toolkit	Pdf document (65 pages) with self-direction rubrics for multiple grade levels
	University of Minnesota's Assignment Calculator	Web-based assignment calculator for high school or college age students

MATERIALS MANAGEMENT

Table 3 - Executive Function Time Management Resources.

How do students keep track of books, papers, gym shoes, and activity supplies? How do they remember to turn in projects/ papers? How do they keep their rooms organized so items can be found? Students who struggle with materials management often do not turn papers/projects in or they are turned in late. They cannot find school and/or sports supplies. Looking for these as they are supposed to be going out the door can cause frustration for the students, caregivers and teachers.

"Materials management skills include the ability to keep one's workspace, play areas, and materials orderly. Students must also understand what materials are needed and be able to readily find and utilize what is needed for a task." (Fairfax County Public Schools Assistive Technology and Executive Functioning Page) Struggles with materials management can lead to frustration for students and teachers alike. Students may miss out on activities or social time due to these struggles. Teachers may need to take time away from other activities to assist students who need to find needed materials.

Students who struggle in this area may be helped by using organizers, checklists, and color coded materials. As part of materials management, it is important to remember electronic materials also need to be managed. Finding systems to manage electronic files and data is an important skill that students will benefit from learning as a lifetime executive function skill.

ORGANIZERS

Organizers can be a way to help students create systems to keep track of materials. Most of us use organizers throughout our day in various contexts such as an In/Out basket or a set of key hooks beside the garage door. Understood.org has an excellent video showing systems for organizing materials called School Tips and Organization: Color-Coding Tips for Organization.

School Tips and Organization: Color-Coding Tips for Organization.
https://www.youtube.com/watch?v=v_RbzEA0Bzc

CHECKLISTS

Checklists and organizers can be a simple strategy that is helpful for students as they learn to keep track of their materials. The Technology Resources for Inclusive Learning website from SETC has an Executive Functioning page with a section for Keeping Task Lists that has several examples of electronic task lists. Understood.org has printable luggage tags for backpack checklists.

A morning routine checklist.

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ELECTRONIC FILE MANAGEMENT

It is important to remember that electronic materials also need management. We have all seen (or have) a computer desktop covered in files and folders which highlights the need to find a system to manage electronic files. This is an important skill for students to learn if they are going to be able to utilize electronic material effectively. One way to do this would be by school year, subject and assignment. For example, an English narrative essay from the spring of 2024 could be titled, "2024English_NarrativeEssay." For more ideas to manage electronic files, Deep Roots Learning system has a video, How to Organize your Google Drive Folders for School, that explains how to organize digital folders. Although the article is specific to Google, the ideas work for any platform.

See Table 4 for these ideas and a more extensive list of tools and strategies. For a more accessible version of table 4, refer to this EF Materials Management Resource Document

Category	Stgratgegy/Tool	Description
Organizers	School Tips and Organization: Color-Coding Tips for Organization	Video (1:24 mins) from Understood.org
	Organization Tips + Tricks for students	Video (3:45 mins) from @ studyquill
	6 Low Cost Organization Tools for Kids by understood.org	Article by Understood.org
	28 Classroom Organization Ideas to Make Your Year Easier	Article by Prodigy listing organization ideas for classroom materials that will help students find materials and put them away which also helps the classroom staff
	MS OneNote Interactive Demo	Interactive demo of Class OneNote
Checklists	SETC Website Executive Functioning Page: Keeping Task Lists	Website with Tools/Strategies and information on Executive Functioning
	BackPack Checklist	Printable luggage tag checklists for backpacks from Understood.org
	Todoist	App to keep track of tasks and To-Do's
Managing Electronic Materials	How to Organize your Google Drive Folders for School	Video (8:34 mins) from Deep Roots Learning The ideas presented here work for Windows and Mac also.
Scanning Apps to Digitize Info	Microsoft Lens for iOS Microsoft Lens for Android	Use scanning apps like Microsoft Lens app to scan information into a digital file

Table 4 - Executive Function Materials Management Resources.

EXECUTIVE FUNCTION INVENTORIES

If you need help to identify a student's strengths and needs, Executive Function (EF) inventories may be a good place to start. None of these inventories are meant to be diagnostic measures. Rather, they are screening tools that can help pinpoint an area or two that you can support or teach some strategies to improve EF.

Dawson and Guare EF Questionnaire (Dawson & Guare, 2009)	Self-report check list where the rater identifies how they think they are doing with certain scenarios; includes a simple intervention guide to identify EF skills to improve and what will be the outcome measure.
Organization Problems Inventory (WATI, n.d)	Can be completed as a self-report or on behalf of someone; answers are not rated on scale; looks at sequential organization, prioritization, temporal organization, spatial organization, categorical organization, and attention.
Cognitive Connections 360 Thinking: Questionnaire for EF Skills	Self-reporting tool about how "true" scenarios are for the rater; scenarios focus on situations involving space, time, objects and people.
EF Age Checklist	Gives various scenarios and the expected age-related response to them; identifies the EF age of the person in specific areas.

CONCLUSION

Students who have difficulty with self management, time management, material management, and information management likely have challenges with their executive function (EF) processes. Given that these skills might not come naturally to them, it's imperative to offer appropriate choices, supports, and strategies while also providing opportunities for them to actively apply the skills being taught. When fostering the development of EF skills, it is necessary to consider the students' strengths, preferences, interests, and motivators and allow them the choice of what tools or strategies they can use. Also consider how these resources can be adapted to various settings, age groups, and environments. We all rely on EF processes throughout our lifespan. This underscores the significance of addressing the executive function of students to give them necessary tools in the classroom, as well as essential skills for life.

RESOURCES AND FURTHER READINGS

CAST: Universal Design for Learning: Providing Options for Executive Function

Enhancing and Practicing Executive Function Skills with Children from Infancy to Adolescence SETC Executive Function Website

Fairfax County Public Schools Assistive Technology and Executive Functioning Page

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Tools and Supports for Executive Functioning Challenges - Loudon County Schools Presentation. Main themes for this article originated from this resource with permission from Judith Schoonover.

Understood.org

CHADD

Why We Should All Be Focusing on Executive Functions: Chopped Analogy

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PAID TOOLS

- App: Pictello
- App: Choiceworks
- App Bundle: Zones of Regulation
- Book: The New Social Stories Book
- Book: Smart but Scattered Kids
- Book/Website: Zones of Regulation
- App: Popplet
- Website: Buncee
- Website: Lesson Pix
- Website: Visual timers and counters ■

Autism Classroom Toolkit:

Simple Supports that Lead to Big Gains

Summary: In this article, the focus will be on an evidence-based classroom toolkit for students with autism, developed by the Illinois Autism Partnership at Easterseals Serving Chicagoland and Greater Rockford. It will highlight tools that have demonstrated effectiveness in improving outcomes for individuals on the autism spectrum. By providing a comprehensive overview of these supports, the article aims to equip educators and clinicians with the knowledge and tools necessary to support students with autism at school.

INTRODUCTION

Do you know that 1 in 36 kids have a diagnosis of autism (Centers for Disease Control and Prevention, 2023)? With the rates of autism and related disabilities on the rise, it is crucial now more than ever that educators and related service providers feel equipped to meet the individualized needs of these unique learners.

Illinois Autism Partnership (IAP) at Easterseals Serving Chicagoland and Greater Rockford was developed to fill this need in school districts across Illinois. IAP partners with a diverse range of clients, including school districts, schools, residential facilities, and police and fire departments, to provide coaching, consulting, and training to individuals serving children and adults with autism spectrum disorders and other related disabilities.

Over the last decade, IAP has had the opportunity to support and collaborate with special education teachers and clinicians across the state. IAP regularly shares their expertise on evidence-based practices for students with autism and continually adapts new and creative ways to apply these practices in the classrooms they support and beyond.

Students with autism are often strong visual learners, greatly benefitting from the use of various visual supports across the school day. Yet, keeping track of, managing, and implementing these tools across staff and environments can, at times, be cumbersome for both the student and the supporting adults. IAP observed and experienced this challenge firsthand for classroom teams and developed a solution to this problem by consolidating and simplifying some of the most beneficial foundational supports for children with autism.

The Autism Classroom Toolkit eliminates the need to juggle several different visual supports and classroom tools and houses those vital tools all in one easy to access location. Students (and adults) can quickly navigate to the color-coded support they need, and the toolkit can travel with the student for consistency across environments.

The design of the **Autism Classroom Toolkit** is based on some of the most common evidence-based practices used in a variety of classroom settings. The intention behind the **Autism Classroom Toolkit** is to provide a "base model" for teachers and clinicians to adapt after determining the individual needs of the student(s) they are serving. It is important to remember that no one tool or type of support will be effective for all students and individual student preferences and needs should be considered when determining what supports to consider for each student.

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Illinois Autism Partnership's Shannon Wess supports a student using the Autism Classroom Toolkit.

REINFORCEMENT

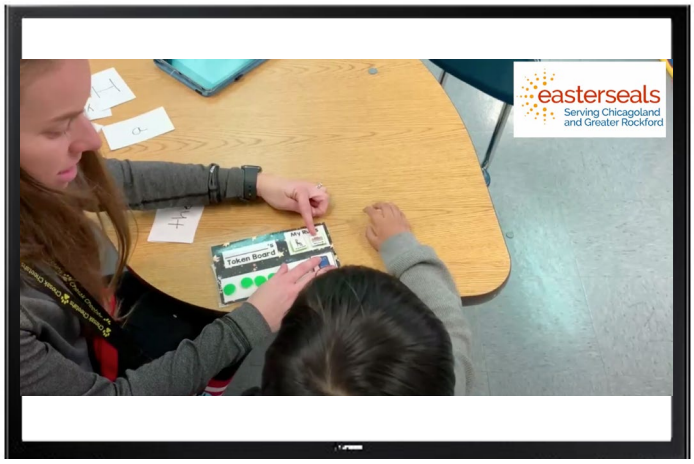
Reinforcement describes a relationship between learner behavior and a consequence that follows the behavior. This relationship is only considered reinforcement if the consequence increases the probability that a behavior will occur in the future, or at least be maintained. Reinforcement is most effective when it is individualized for a particular learner with autism spectrum disorder and when it is presented in response to a learner's use of a target skill/behavior. Reinforcement has been shown to be effective at the preschool, elementary, and middle/high school levels. The goal of this evidence-based practice is to increase skills while gradually fading reinforcement strategies to promote maintenance and generalization (Neitzel, 2009).

While token boards have become a common reinforcement strategy in many special education environments, a simple but important component is often overlooked. Educators are encouraged to ensure student-specific behavior expectations are included on all token boards, as this can help to reinforce the learning connection for students between their behavior and earning the tokens. Visual expectations also serve as a reminder for supporting adults and can help ensure consistent token delivery across people and environments.

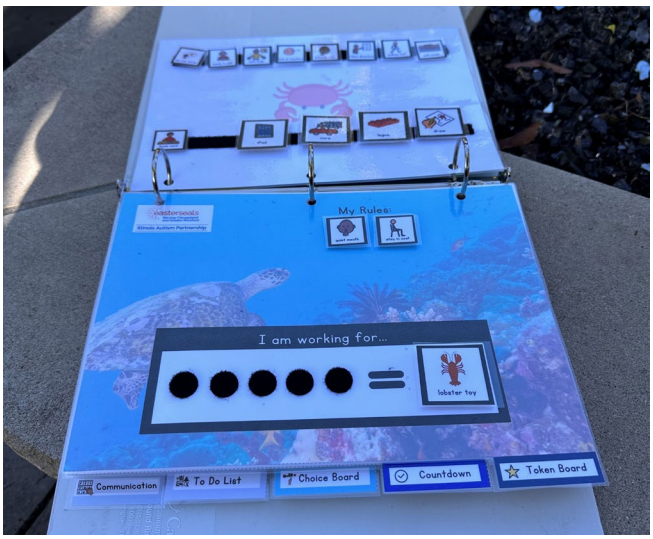
For students that struggle with a delay to reinforcement or may still be learning the value and excitement of tokens, a first/then board can be a great starting point! While many may look at a first/then board as a schedule tool, (e.g. first math, then reading), first/then boards are a foundational tool based on the principle of positive reinforcement. This tool can help the student to see that first they do the thing they have to do, then they get to do the thing they want to do. This type of support can be beneficial for even our youngest learners.

The Autism Classroom Toolkit contains a token board that includes the essential components for a basic, customized token board. Educators are encouraged to embed student interests, when possible. For example, if a student loves pirates, the token board page could include a pirate-themed background and gold coins as the tokens. Or, if a student loves Legos, the board is Lego-themed, with minifigure behavior expectations, and each token is a Lego piece.

Check out this video of a Token Board in action.



Using a Token Board.
https://www.youtube.com/watch?v=OqHHYsSiLJ4



An example of a customized token board for a student who loves ocean animals.

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COUNTDOWN STRIP

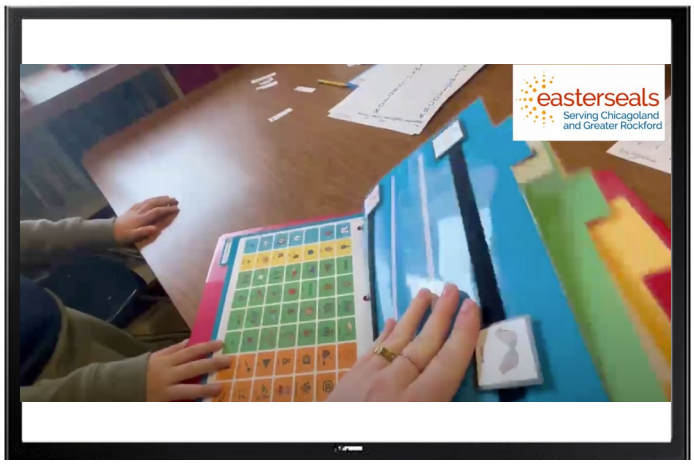
Visual Supports are any tool presented visually that supports an individual as he or she moves throughout the day (Hume, 2008). Many students with autism can benefit from visual supports that help them to wait, show the passage of time, and see their schedule for the day. Countdown Strips are one such visual tool that can support students with autism by promoting predictability, providing structure, embedding reinforcement, defining an amount of time, and teaching flexibility.

While visual and countdown timers can be an effective tool for the classroom, sometimes, there may be situations where we don't know how much time remains. For example, if a student is completing a worksheet and we want to show the passage of time but focus on work completion versus a set amount of time, we might use a countdown strip to help the child see their progress with this task. A teacher might say to the student, "Five more problems, and then we are finished!" As each problem is completed, a number is pulled off as the teacher "counts down."

Some students might be able to tolerate a 10 number countdown strip, while other students might need a 3 or a 5 number countdown strip. It is very important to factor individual students' needs into determining appropriate and effective tools to include in their toolkits. Additionally, there are different ways to present countdown strips, such as drawing an X over numbers with a dry erase marker, closing a tab or flap on top of a number, placing an X or similar icon on top of a number, or pulling Velcro numbers from a chart. However, a countdown strip is set up for a student, the idea that "time is passing by" is something that can benefit all learners.

The **Autism Classroom Toolkit** includes a basic 5 number countdown strip with number cards to pull off as each step is completed or as time passes by. The top page houses the extra pieces, while the bottom page includes the countdown template. This particular support would be used by telling the individual, "We have five more ___" or a similar statement. A number would be removed from the book as you complete the count down to 0. Typically, something motivating (e.g. toys) would be included at the end of the countdown, thus teaching the learner that it's exciting and fun to count 5-4-3-2-1.

Check out this video of the Countdown Strip in action.



Countdown Strip and TO DO List.
https://www.youtube.com/watch?v=Z_lqNh2GNdQ

A teacher supports a young student with a countdown strip during a literacy activity.

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CHOICE BOARD

Antecedent-based Interventions (ABI) are evidence-based and proactive strategies designed to reduce the occurrence of interfering behavior. ABI focuses on modifying the environment and changing elements that could trigger an interfering behavior. ABI includes strategies such as modifying the environment, providing choices, and using motivating items (Neitzel, 2009).

A choice board is a visual representation of items/activities that are available to choose from. This tool is used to encourage communication, provide a visual reminder of what choices are available, and encourage independent decision-making throughout the day. Giving students choices is a very effective way to enlist their cooperation. The primary purpose of giving a person choices is to have him or her have some control over certain situations. Both adults and children like to have some control over their lives. It is more satisfying or motivating to be able to decide which snack one might have, which video to watch, or whether one does math first or second. Providing choice is a positive programming strategy that may reduce some situational behavior problems (Vicker, 1999).

There are many ways to introduce a choice board into the day. The choice board that is included in the **Autism Classroom Toolkit** is a simple page for choices to be displayed. These choices can include anything from activities to snacks to preferred peers or adults. All students have different needs and it is important to determine how many choices should be available to each student. For entry level choice board users, it is common to only have available choices displayed on the board. This helps to prevent frustration by ensuring that any choice the child makes will be one that is available to them.

Check out a video of the **Choice Board** in action.

Choice Board (Toolkit).
https://www.youtube.com/watch?v=eGJRX_g2Pjg

TO DO LIST

Visual activity schedules and structured to do lists draw upon three evidence-based strategies: antecedent-based interventions, prompting, and visual supports (Hume et al., 2021). They are considered an antecedent-based intervention in that they are typically presented to the individual prior to the initiation of the task or activity as a visual cue to help the individual know what the expectations are and what is coming next. Providing clear expectations for individuals with autism can reduce the likelihood of interfering behaviors from occurring by decreasing anxiety and increasing predictability. To Do lists can be considered a prompt or support in completing necessary tasks throughout the day. Having a visual sequenced checklist of what comes next can promote confidence and independence in completing the activities.

The To Do List page in the **Autism Classroom Toolkit** gives educators and other supporting adults the flexibility to provide a task list to the individual they are supporting. This can be in the form of an independent work task list, a structured visual agenda for a lesson or therapy session, a full or part day schedule, a structured centers or stations rotation task list, a task analysis for a specific skill, or any sequence of activities that the individual needs to complete.

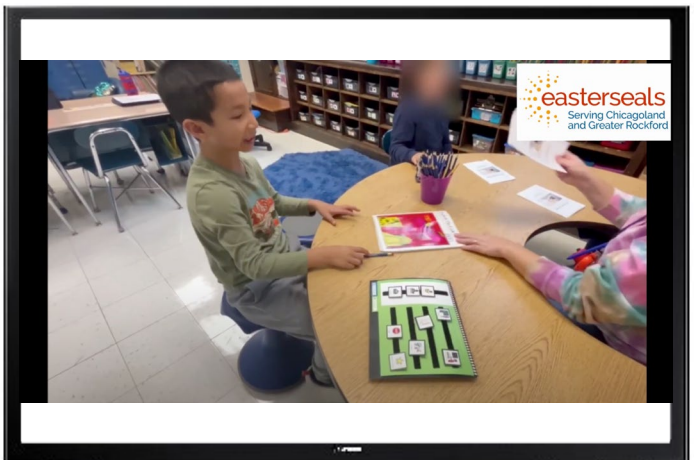
For an *independent work task list*, numbers, letters, or specific work task cards can be used to structure an independent work session for a student. The To Do List page allows the adult or student to set up their independent work cards in order, with the option to match them to their work tasks, place them in a "finished" bucket, or replace them on the right side of the page when they have completed each task.

For a *structured visual agenda* for a lesson or therapy session, the supporting adult can choose the activities available and allow the student to place them in order, or if it is non-negotiable, the supporting adult can place the activities in the desired order on the page. Similarly, the student can pull off each card as it is completed and replace it on the "finished" side or in a finished bucket at the table they are working on.

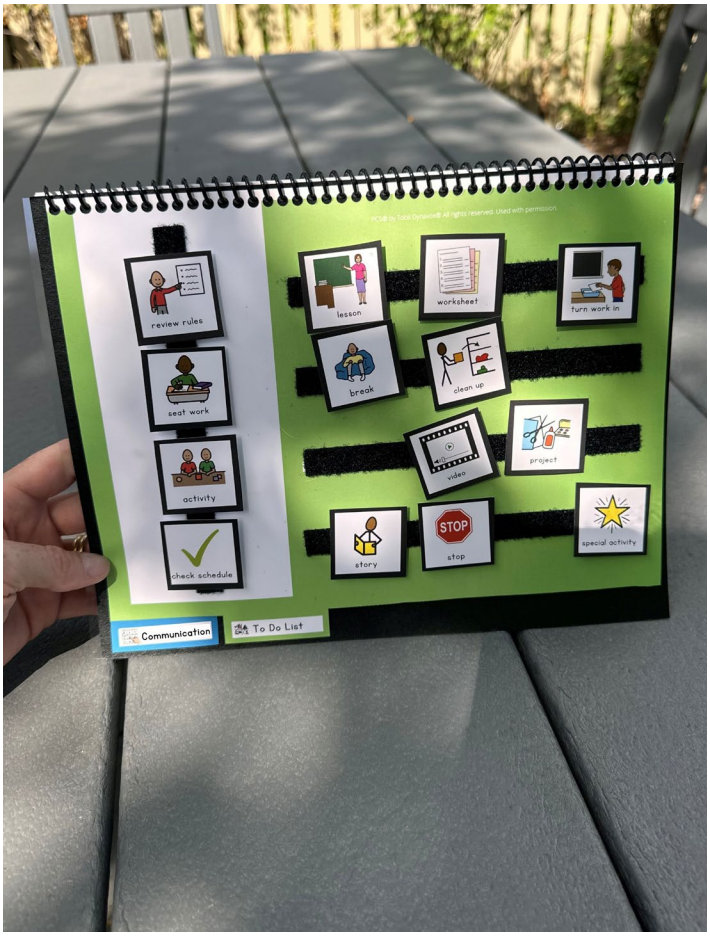
For a *full or part day schedule*, a sequence of events can be written or attached in the order the events/activities will occur. Some students benefit from being able to bring their schedules with them throughout the day. The space available in the Autism Classroom Toolkit To Do List page may not allow for a full day schedule, but the list could easily be modified into a two page or two column schedule as needed for individual students.

For a *structured centers or rotations task list*, the student's assigned centers can be placed in the correct order on the to do strip. Typically, the student would then match each card to the corresponding center or table (e.g. red table).

Check out a video of the To Do list in action.



To Do List.
https://www.youtube.com/watch?v=UYdEi8MiwJ8



To Do list for structured individual therapy session.

COMMUNICATION BOARD

About 25–30% of children with autism do not develop any functional verbal language or remain minimally verbal throughout their lives (Posar & Visconti, 2022). Developing effective communication skills is crucial for children with autism, as it empowers them to express their needs, engage in social interactions, and navigate the world with greater independence and confidence. Many students with autism benefit from the use of augmentative and alternative communication. All children can benefit from communication and visual supports. The entire **Autism Classroom Toolkit** can be considered a visual support that is used to promote functional communication skills.

The **Autism Classroom Toolkit** also has a page that is dedicated to "low-tech" communication supports. This can include a printed copy of the student's AAC core words, Functional Communication Training cards, and any other basic communication supports. The included page in the toolkit is from TD Snap. Utilizing a customized low-tech communication board tailored to the specific needs of the student can effectively support their communication abilities and facilitate meaningful interactions. The top (empty) page allows individuals and supporting adults to choose important and meaningful words that can be readily accessed throughout the day.

TD Snap Communication board (bottom) with easy access functional words (top).

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CONCLUSION

In conclusion, incorporating evidence-based tools in a classroom for students with autism is vital for promoting optimal learning and development. Illinois Autism Partnership has simplified this process by developing the **Autism Classroom Toolkit**. By relying on interventions and strategies that have been rigorously researched and proven effective, educators can provide targeted support that addresses the unique needs of students on the autism spectrum. These evidence-based tools not only enhance academic progress but also foster communication abilities, promote positive behavior, and enhance overall school success. By implementing evidence-based tools, educators can create supportive learning environments that empower students with autism to reach their full potential and thrive both academically and socially.

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RESOURCES:

Print-Friendly Autism Classroom Toolkit
Blank Autism Classroom Toolkit
Create Your Own Pieces with Boardmaker ■