

# Closing The Gap

## Solutions

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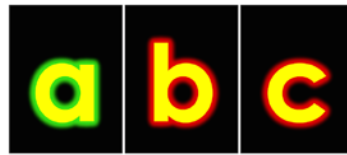
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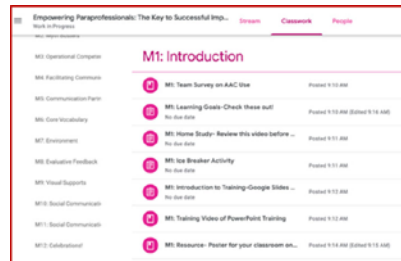
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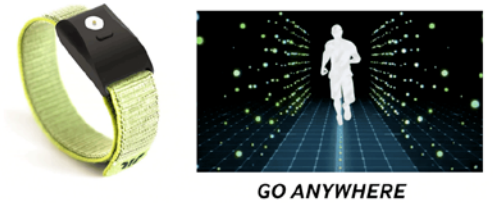
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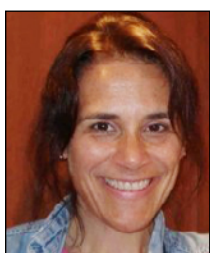
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# Comprehensive Emergent Literacy Instruction for Students with Significant Disabilities, Including Cortical Vision Impairment and Complex Communication Needs

## ARTICLE SERIES SUMMARY

When and how to make literacy adaptations for students who have complex communication needs combined with Cortical Vision Impairment can be a difficult task that requires systematic interprofessional collaboration. This article series will focus on the 5 daily emergent literacy routines recommended by Erickson (2017): shared reading, Predictable Chart Writing, alphabet/phonological awareness activities, independent writing, and independent reading. To build confidence and meaningful engagement, augmentative and alternative communication is integrated throughout. The following article will provide background knowledge about CVI, CCN, emergent literacy and the trifocus framework.



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## INTRODUCTION

Students with Cortical Vision Impairment (CVI) and complex communication needs (CCN) pose a daunting challenge to professionals who are working to build students' vision, communication and literacy skills. To facilitate student progress, professionals need to share their expertise. Building a solid emergent literacy foundation is essential for later conventional literacy learning. To promote balanced instruction which takes into consideration CVI interventions and comprehensive emergent literacy instruction, this article will provide an overview of CVI, as well as emergent literacy. To foster inter-professional collaboration, a trifocus model will be described to plan instruction that considers the learner, partner and environment. Five broad instructional strategies are emphasized in the trifocus framework proposed by Bruce and Bashinski (2017): enhancing (partner) sensitivity, utilizing routines, increasing communication opportunities, modifying the communication environment, and augmenting input. These principles will be interwoven throughout this article.

## CORTICAL VISION IMPAIRMENT CHARACTERISTICS AND GENERAL LITERACY IMPLICATIONS

Professionals and communication partners need to understand and be sensitive to the impact of CVI in order to design the most appropriate literacy instruction and presentation of literacy materials. CVI is a neurological disorder which impacts the visual processing of information in the brain. It is frequently undiagnosed or unrecognized due to multiple physical/cognitive impairments. In the past decade, knowledge about CVI has grown rapidly (Roman, 2018; Lueck & Dutton, 2015). Observing a particular routine/task from the visual perspective of the learner can help guide interprofessional collaboration when designing adaptations. According to Roman-Lantzy (2018), there are 10 CVI Characteristics that can be measured by the CVI Range Assessment Tool (see Table 1 for characteristic descriptions and general literacy implications). Students' abilities within and across the characteristics determine their severity of CVI. The 10 characteristics can be used to guide intervention and adaptations, using the CVI Characteristics: Teaching Strategies and Accommodations Planning Guides, found here (<http://cvi.bridgeschool.org/interventions/>).

<b>Characteristics</b>	<b>Description</b>	<b>Literacy Implications</b>
Color Preference	There may be specific colors that attract students vision	Preferred colors can be used within a literacy activity to facilitate visual interest
Visual Field Preferences	There are certain fields where students may not be able to see.	Identify the fields where students can see in order to effectively position literacy materials
Need for light	Students may stare up into the lights	A personal tablet/screen may provide backlight that improves ability to sustain visual attention during reading and writing tasks
Need for Movement	Students may need an item to move in order to get their visual attention	Use digital books with animation. Reflective tape around the edges of a personal screen/tablet can draw visual gaze as the device is moved from peripheral to the student's central vision
Visual Complexity	Students have difficulty with processing things with a busy, complex background.	Consider degree of complexity in books and other literacy materials. Use masks or occluders to minimize clutter
Visual Novelty	Students don't notice new things in their environment	When making activities, use pictures that are familiar to student. Choose media that allows a person to record a verbal description of the picture (salient feature description)
Difficulty with Visually Guided Reach	Students may have difficulty reaching for something while using their vision to guide their hand.	If students have trouble using their hands to manipulate literacy materials, identify a different position or different way for student to access materials, such as through using switches
Visual Latency	Students may take a long time to process visual information.	Give students uninterrupted time to look at books and other materials
Atypical Visual Reflexes	Students may have a delayed blink reflex. This is used for evaluation purposes only.	No intervention strategies improve this reflex
Difficulty with Distance Viewing	Students have difficulty with complexity of array when viewing items at a distance	Presenting information with a projector or Smart Board may not be visually accessible. Using a personal tablet/screen or focusing on auditory input may be necessary during group time.

Table 1: CVI Characteristics and General Literacy Implications



Students' performance ratings on the characteristics are used to classify their level of CVI. In broad terms, Roman-Lantzy (2019) refers to 3 different phases of severity of CVI. Phase 1, Building Visual Behaviors, describes students who have little functional vision and are learning to simply use their vision to look at something. Phase 2 describes a student in general terms who is learning about Integrating Vision and Function, figuring out what they are looking at and attaching meaning. Phase 3 describes a student who has a great deal of vision but requires specific instructional support as he/she is Developing Visual Curiosity.

## COMMON CLASSROOM OBSERVATIONS OF STUDENTS WITH CVI

Students with CVI may not be able to look where the teacher points, and are often seen looking elsewhere, or not looking at all. Some students may seem to be focusing on items in the environment that are not part of instruction, gazing up at lights or fans, watching shadows or other people moving around the room. A student who is listening hard when a story is being read may have his head down with eyes closed, and is definitely not looking at the book or the teacher. Another student might be rocking back and forth in her chair, using movements of his/her own body to stimulate peripheral vision. Often these observations may be interpreted as behaviors, when they are really a result of the student's CVI. Empathy and sensitivity, getting down and looking at the classroom from the student's perspective, is required to fully understand what the student is doing and why he is doing that. Only then can we design productive learning environments for these students.

As is necessary for all students, the support team should collaborate on how to modify instructional materials and activities. Team members should consider use of the CVI Characteristics: Teaching Strategies and Accommodations Planning Guides found here (<http://cvi.bridgeschool.org/interventions/>). On this form, each of the CVI Characteristics is listed with places for the team to fill in the teaching strategies and accommodations. Consider the characteristic of difficulty with distance viewing as an example. A student with mild CVI may be able to see 4-6 letters at a time when they are presented on a backlit tablet that is nearby. That same student may need letters presented larger and only one or two at a time during small group instruction. During large group instruction visual functioning may be extremely limited due to auditory distractions or other people moving around the room. Therefore, one student may need to have access to multiple accommodations during the school day in order to participate fully in emergent reading and writing activities by actively manipulating the letters and sounds of the alphabet, recognizing patterns of connected words, and getting/making meaning from stories.

Many students with cortical vision impairment have difficulties visually processing photographs of faces, and may struggle

to read facial expressions in real life. They may also be unable to visually follow where somebody is pointing to establish a joint reference when communicating with a partner. This may impact how their social-linguistic skills develop. Utilizing routines and increasing familiarity with materials by providing consistent visual descriptions can be beneficial. Engaging in the process of writing and sharing personal experience stories (Hagood, 2014) and home-school journaling (Mogan, 2018) can be used as a context for building social-linguistic skills (Wagner, 2019).

It is easy to see how CVI can get in the way of students' literacy learning. However, students' vision must not be a roadblock or a gatekeeper to rich, authentic literacy opportunities. There are multiple facets to literacy development, many of which don't require vision. In addition to the CVI characteristics, professionals need to have enough knowledge about the details of literacy development in order to design instruction, starting with emergent literacy.

## OVERVIEW OF EMERGENT LITERACY

The term emergent literacy describes the process of beginning, exploratory reading, and writing experiences of children before they learn to formally read and write (Teale & Sulzby, 1986). Emergent literacy is not about identifying sight words, phonics instruction, spelling words, or taking comprehension tests—these are all conventional literacy skills. Instead, emergent literacy refers to the foundational experiences that prepare children for such conventional instruction once they enter elementary school. Teale and Sulzby (1986) outlined four principles that apply to the earliest stages of literacy learning, all of which have important implications for how we design literacy instruction for students with CVI. These key principles are described, followed by implications for students with significant disabilities (Koppenhaver, Coleman, Kalman, & Yoder, 1991).

### **No Student has to be Ready for Literacy: Literacy Learning Begins at or Even Before Birth**

With this concept in mind, most children are exposed to literacy before they even know what to do with it. Many parents create environments filled with books, crayons, print-rich toys, and even print-rich clothes and room decorations. Children cannot help but not see print all around them (e.g., labels, signs, recipe books, mail, posters). They also see others using print (e.g., dad writing a shopping list, mom reading the newspaper). Adults read to children, often over and over; some parents even read to their children in utero. These rich experiences are ongoing and numerous; in fact, some children have more than 1,000 hours of these early print-based interactions by the time they begin school. (Heath, 1983). Through this emergent lens, it is clear that children are born "ready" for literacy (Teale & Sulzby 1986).

**Implications for students with significant disabilities:** No student, regardless of their disability and



cognitive status, needs to be “ready” for comprehensive literacy instruction (Erickson, 2000). Our task is not to determine “readiness” of the student, but we do need to ensure the “readiness” of the environment and the right materials to provide rich literacy exposure and experiences that are meaningful and accessible to all of our students.

### **Reading, Writing, Speaking, and Listening Abilities are Interconnected and Develop Simultaneously**

Their interconnectedness can be demonstrated in the most common of emergent literacy experiences, such as reading stories to young children. This shared experience imparts a wealth of knowledge to children, such as the purpose of books and what it means to be a reader, as well as providing a time to bond with a trusted caregiver. Children use what they have seen about the print in books to construct their own books through experimenting with writing. Shared reading is rarely a quiet time; instead it is an enjoyable, interactive activity that facilitates children’s speech and cognition. Children build their vocabulary and are encouraged to label pictures, comment, and ask questions. Adults respond to children with explanations of words and important concepts from the book. Thus, reading contributes to children’s abilities to write, speak, listen, and develop important receptive language concepts.

**Implications for Students with Significant Disabilities:** Each of these areas need to be addressed in students’ daily literacy instruction, most notably communicating and writing. Students who have difficulty speaking should be learning to communicate using some form of augmentative and alternative communication (AAC). In order to have the types of rich interactions and conversations as their speaking peers, AAC systems need to be robust (including generic/functional core words, personally meaningful topic- or category-associated words/phrases, and all letters of the alphabet). To learn to express individual thoughts, students need to learn how to use the letters of the alphabet for writing. Too often, students with significant disabilities are not given opportunities to write with the full alphabet as professionals may perceive writing as too cognitively or visually challenging. However, as seen through an emergent literacy lens, learning to communicate and write with accuracy is not the immediate goal. No different than young children without disabilities, when exploration and experimentation is encouraged, concepts are built and skills develop through interactions with a more knowledgeable communication partner.

### **Literacy Learning Occurs When Children Are Actively Engaged**

Children’s overall success in learning is dependent on their ability to actively engage in each of the areas described in the above section. Young children without disabilities learn by actively “doing,” and without question are given free rein to experiment with books, crayons, and other literacy materials. In the beginning, children do not have a clear sense of what to do with these items, and their physical abilities to manipulate them are limited and random (e.g., holding books upside down, eating or scribbling with a crayon). Their exploration of materials is encouraged, and over time they become more refined. Children learn about writing by writing. Children learn about books by using books.

**Implications for Students with Significant Disabilities:** Due to the nature of their disabilities, these students tend to be passive observers. Professionals need to identify methods and appropriate materials that students can easily explore. Assistive technology plays a necessary role. For example, students may be unable to physically use their hands to explore books, and may benefit from using switches to turn pages in digital books on the computer or iPad. For students who cannot see the page, many digital books offer a read aloud feature. Environmental considerations will include evaluating how background noises and movement affect visual concentration as some students with CVI cannot look and listen at the same time. To support writing, students will need some form of “alternative pencil,” which does not require hand use to form letters (Erickson & Hanser, 2004). Alternative pencils consist of a paper or electronic keyboard from which students choose letters. Alternative pencils can be easily modified to accommodate students who have even the most severe CVI, for example, using reduced letters arrays and highlighting the letters using the glow feature in Microsoft Word. (See Figure 1)

Different “pencils” may be used throughout the day. Partner sensitivity to levels of visual fatigue or stress should take advantage of routines as the multidisciplinary team discusses how to modify the environment or writing task to reduce distractions and improve performance at various times during the day. For more information about alternative pencils see: The Center for Literacy & Disability Studies, University of North Carolina-Chapel Hill, [www.med.unc.edu/ahs/clds](http://www.med.unc.edu/ahs/clds).

### **The Functions of Literacy are Just as Integral to Literacy Learning as the Forms**

Not only do most children learn the different ways to form print/Braille, they also learn that print has a function—it conveys



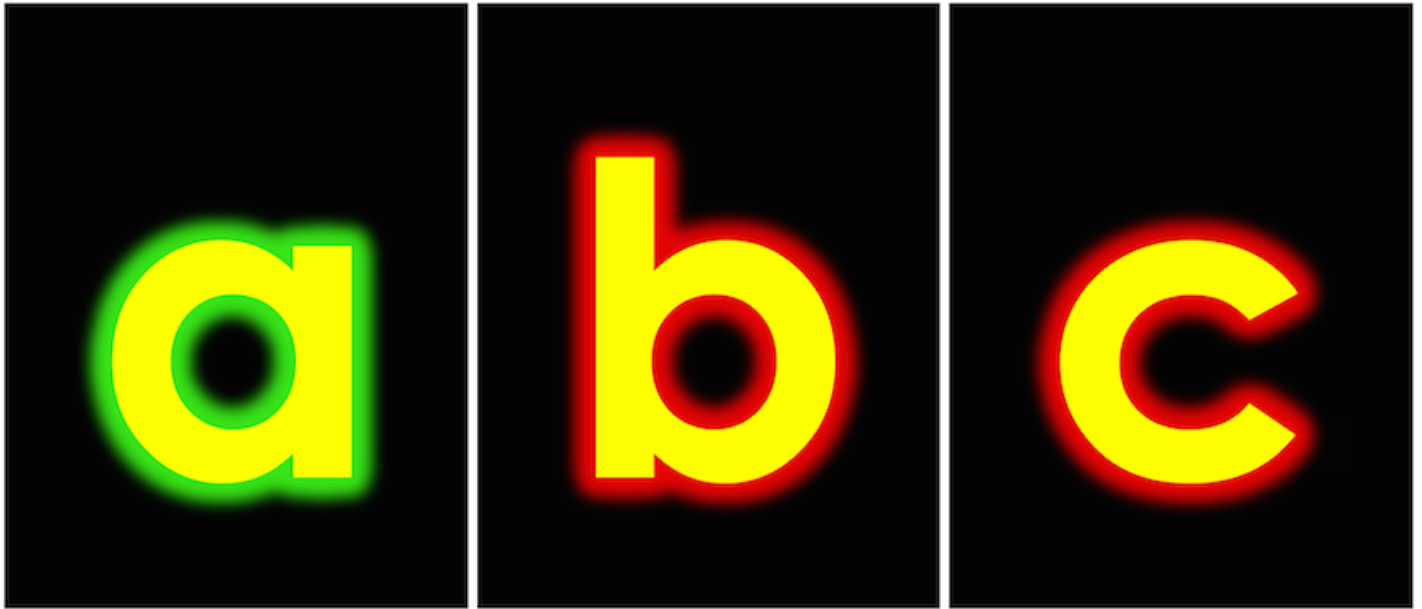


Figure 1: Sample page from a modified Print Flip Chart with letters that have the “glow” font effect in Microsoft Word.

a message. Print/Braille is used for a variety of functions, such as sharing information (making a shopping list), giving instructions (reading signs) and fostering relationships (writing e-mails and letters). Early on, adults teach children about these functions without much deliberate thought. Children’s early motor skills are awkward and unrefined; however, their development is facilitated by the meanings that adults ascribe to the unrecognizable scribble. For example, while sitting next to a parent making a grocery list, the child makes a random mark. The parent may attribute meaning to the child’s attempt, praising him/her for the list addition. Taking the list to the grocery store and using it teaches the child about the functions of print. Even though their writing is not recognizable, it conveys an idea and something important happens.

**Implications for Students with Significant Disabilities:** Instruction for students with significant disabilities including CVI may tend to focus on the form and shape of letters and words rather than their functions in a variety of contexts. This can lead to isolated, splinter skills. Personally meaningful writing activities that are authentic, such as home-school journaling (Mogan, 2017), can lead to greater understanding of “why” we are writing down thoughts rather than focusing on the form of letters.

## BARRIERS TO LITERACY INSTRUCTION FOR STUDENTS WITH SIGNIFICANT DISABILITIES

While the principles of emergent literacy have been described in the previous section, there may be barriers that prevent students from receiving this kind of quality, comprehensive

instruction.

- Professionals may have a “readiness” view of literacy. As a result, students may be given limited opportunities to explore a wide assortment of literacy materials. This occurs most frequently with writing with the full alphabet. Assistive technology plays a huge role in giving students access to such basic activities, ie. alternative pencils modified for students vision and physical needs.
- Literacy instruction may have a strong focus on building vision. As a result, the scope of literacy instruction may be limited to what the student can see or what they are working on seeing. However, students can be taught a wide range of literacy concepts through auditory channels.
- Students don’t get the appropriate type of instruction. Students may receive conventional literacy instruction when they should be receiving emergent literacy instruction. Although emergent literacy is a necessary foundation, professionals may not know the difference between emergent and conventional literacy instruction, so they try to simplify conventional instruction. However, within the field of literacy for students with the most significant disabilities, emergent literacy instruction has been documented as an effective approach (Erickson, Clendon, Abraham, Roy, & Van de Carr, 2005; Erickson, 2017).
- Daily instruction might be limited to mechanical skills (e.g., identifying letters and sounds), rather than comprehensive emergent literacy opportunities.
- Students have limited opportunities to explore robust AAC systems which contain vocabulary for commenting, protesting, questioning, and communicating about books using adjectives and verbs. Vocabulary may be limited to

what they can see and/or touch with their hand. As a result, vocabulary may be limited to a few basic needs, which limits rich conversations during reading and writing. However, interprofessional collaboration (Bruce & Bashinski, 2017) can consider different strategies to minimize the visual complexity while still having access to a robust AAC system. Examples: hiding/showing vocabulary (teacher/SLP), systematic branching which decreases number of visuals while branching to more vocabulary (SLP), increased spaces between cells or use of switches (OT, PT), and use of auditory prompts (teacher/SLP). (See Figure 2 and 3 - Core Word Displays)

## EMERGENT LITERACY INSTRUCTION AND THE TRIFOCUS APPROACH TO COMMUNICATION

Including students with CVI and CCN in literacy learning involves considering their communicative attempts and requires highly individualized approaches. Any attempt to describe how a learner is functioning and what adaptations are necessary must also consider the communication partner and environment. Bruce & Bashinski (2017) offer these five strategies to guide interprofessional collaborative practice (ICPC):

- Building Partner Sensitivity - can foster feelings of empathy and lead to greater mutual understanding

A teacher who understands why a student closes his eyes when listening will recognize times when the student is listening and when she can be encouraged to look (without other competing distractions). The teacher can learn to respond consistently to the non-symbolic or idiosyncratic signals that the student uses for expression.

- Using Instructional Routines - can reduce stress and provide a context for learning

Once a student is comfortable with a repetitive routine that is naturally or regularly occurring, he/she is more likely to notice when/where changes occur. For example, a predictable song or story can be modified with different sounds and/or letters for each student in the class.

- Increasing communication opportunities - can increase interest and engagement

Students can be given frequent opportunities to express themselves for multiple purposes (e.g., giving opinions, asking questions, denying/protesting, etc.)

- Modifying the communication environment - can improve function

Performance improves when materials are adapted to address visual needs and environmental context is also considered (e.g., using non-glare laminate when creating high contrast)

## COMPREHENSIVE EMERGENT LITERACY INSTRUCTION FOR STUDENTS WITH SIGNIFICANT DISABILITIES

While students with significant disabilities have had extremely limited emergent literacy experiences, there is direction from the field that can guide appropriate instruction. Erickson (2017) recommends the following daily activities for learners who are at the emergent literacy level:

- Shared Reading,
- Predictable Chart Writing,
- Alphabet and Phonological Awareness,
- Independent Writing with the whole alphabet, and
- Self-Directed Reading.

Literacy is a complex process and requires learning in many different areas in order for students to truly grasp and internalize what it means to be a writer and a reader. Upcoming articles in this series will focus on each area in depth with details about the “what and how” of implementing the activities with students with CVI. A critical element of the “how,” will be understanding how CVI characteristics affect access to learning opportunities for each student. The sections below describe how considerations of the learner, partner and environment can be reviewed in our efforts to enhance partner sensitivity.

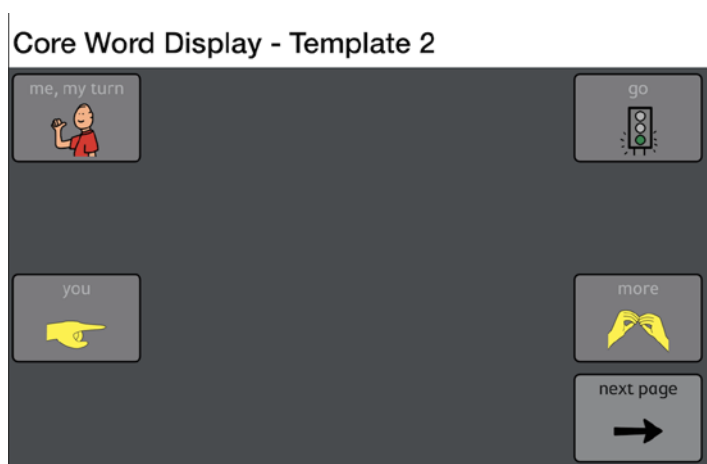
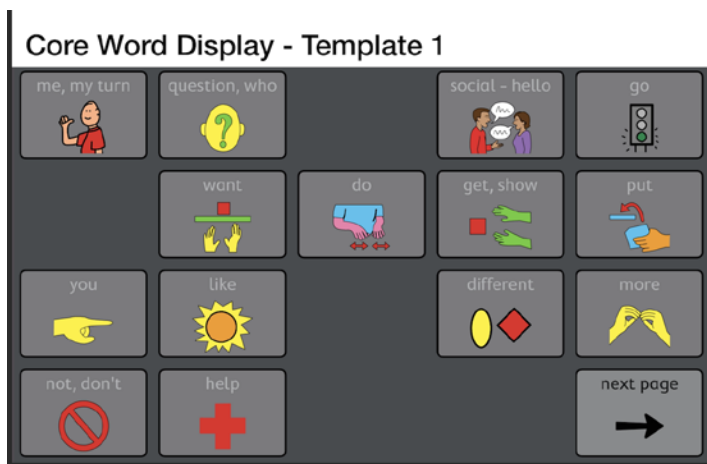


Figure 2: Core Word Display - Template 1

Figure 3: Core Word Display - Template 2





materials, reducing visual clutter and increasing empty spaces between items, presenting items in preferred visual field)

- Augmenting input - can help a student understand his/her world

Materials can be presented in combination with verbal descriptions, touch cues, gestures, object cues or symbols, provided all communication partners agree to do so in a consistent way.

## MAXIMIZING ENGAGEMENT IN EMERGENT LITERACY ACTIVITIES

When and how to make adaptations for students who have CCN and CVI can be a difficult task. Just knowing the 5 recommended daily emergent literacy routines is insufficient.

Interprofessional collaboration supports understanding how vision affects conceptual learning, how experiences drive language learning, and how critical self-directed engagement is to literacy learning. Daily emergent literacy activities should be integrated with exposure to and active experiences with symbol-based communication systems. Any adaptations intended to support students with CVI during literacy-based activities must be considered within a trifocus framework: learner, partner and environmental considerations.

## LEARNER ASSESSMENT/CONSIDERATIONS

Using an AAC Profile (Kovach, 2009) and/or AAC Portfolio (VanTatenhove, 2014) can document the student's use of multi-modal forms of communication for multiple functions, receptive and expressive linguistic levels, current ability to operate a speech generating device, and social skills.

Considerations for all literacy activities can include modifications based on how CVI characteristics affect the student's ability to functionally participate. Team members should consider salient feature instruction and use of the CVI Characteristics: Teaching Strategies and Accommodations Planning Guides found here (<http://cvi.bridgeschool.org/interventions/>).

To assess emergent literacy, The BRIDGE is an observational portfolio rating scale that can provide a window into emergent literacy tools and tasks. It measures students' emergent literacy knowledge in the following areas: foundations of reading, foundations of writing, alphabet knowledge, phonological / phonemic awareness, and oral language (related to literacy activities). The BRIDGE assessment was developed as an assessment tool for preschoolers with disabilities (Pierce, Summer, & O'DeKirk, 2009) and has been modified by Erin Sheldon ([www.aacintervention.com](http://www.aacintervention.com/) / 2019, Tip # 3) to support learners of all ages, including students with complex communication needs.

Another tool to help identify a starting point is the All Children Can Read: Literacy Skills Checklist found at: <http://literacy.nationaldb.org/index.php/literacy-development-continuum/>. This is an easy to use observational checklist that helps teams

decide on students' general emergent literacy needs.

## PARTNER ASSESSMENT/CONSIDERATIONS

Students' receptive and expressive language learning may be affected by limited ability to watch and learn from others. Conversational partners (including instructional staff) need to carefully consider the complexity of language they use when interacting with a student who does not have typical vision. Partners who are more sensitive to idiosyncratic communicative efforts respond in ways that are more empathetic and understanding of how vision affects learning concepts and communication. Scripting the language of instruction can help build trust, anticipation of routines, and confidence to take risks in learning new tasks. As the team is considering how to integrate emergent literacy instruction into a daily schedule, team collaboration is critical to determine the methodology and routines for modeling language, particularly if the student does not have clear speech and will need some form of augmentative communication. The AAC Profile (Kovach, 2009) and/or AAC Portfolio (VanTatenhove, 2014) can be used to guide discussions about how team members are supporting various levels of communicative skill.

The student's ability to successfully participate in literacy activities may also be influenced by what the **partner** is doing, as well as the arrangement of the learning **environment** and materials. When a student is experiencing visual fatigue, sometimes brought on by competing sensory input, the partner may recognize that in some instances it will be more functional to use an auditory only approach, without requiring visual attention. Partners (whether peers or instructional staff) may need to position themselves or materials appropriately to address difficulties with distance viewing, light gazing or visual field deficits. Visual clutter (complexity) may be a factor either because the array is too complex or because items are too far away. To reduce challenges with distance viewing, the team may consider: 1) tools for video modeling, 2) scripts for video modeling to maintain predictability, and 3) a quiet time/place for the student to watch the playback videos on his/her own. See 2019 Tip #2 Making Movies on your iOS Device for more ideas (<http://www.aacintervention.com/page/180009852/180117546/Tips-2019#tip%202%202019>).

Environmental Assessment/Considerations: Environmental modifications during emergent literacy tasks may include reducing visual distractions of other people moving around the room, or auditory distractions of other people speaking while the student's attention is focused on looking. Some students are unable to look and listen at the same time. Depending on the time of day, medication effects, and environmental distractions, the student may need to have a visual break. During these times the student can primarily listen, such as listening to an electronic version or a partner reading the story he/she chooses rather than doing the visual hard work of looking at the pages/text. Resources for considering the complexity throughout the



school day can be found in the “What’s the Complexity” chapter by Tietjen (2018) and in the Bridge School Intervention Plans, under “Guide to Planning Accommodations Across the School Day.”

## PULLING IT ALL TOGETHER

As described in previous sections, all team members have a role in maximizing engagement and providing meaningful emergent literacy experiences for our students. This case example highlights how team members must take into consideration the communication partners and environment when making adaptations for CVI. It is impossible to describe learner needs and abilities without also considering how the environment has been modified and the role of communication partners.

Amy and Jonas are both in a preschool classroom with students who have multiple disabilities, many of whom have some type of vision impairment along with significant cognitive delays. Amy has cerebral palsy, spastic quadriplegia, and mild CVI. Jonas had a brain injury as an infant and experiences more profound visual and auditory processing challenges. The program receives support from the state deaf-blind project and a teacher of the visually impaired, in addition to the SLP, OTR, and PT. Classroom materials are being adapted following team collaborations that consider student preferences for types of media presentation. The team is working on using personal experience stories and home-school journaling for self-selected reading as well as providing a personally meaningful context for daily shared reading/writing tasks (including predictable chart writing). Although her scores indicate a mild CVI, Amy is definitely a visual learner. She likes looking at pictures on her mom’s phone, raking her hand across the display to change the photos. Due to her motor challenges, she can’t really manipulate the cards with tactile enhancements that her teacher made for Jonas to represent names of their classmates. She needs to learn how letters of the alphabet work, but can’t see when her mom types on the phone. She was recently evaluated for a personal communication system since she is also physically unable to express herself verbally. The team will collaborate on adapting the alphabet pages to make sure Amy can visually distinguish and physically target the letters. Her teacher uses a backlit tablet for instruction. When the teacher (or an instructional assistant) is modeling how to use the letters of the alphabet during a group session, they will need to consider the complexity of the array for distance viewing. One letter presented at a time, using glow coloring on a black background (so it looks like neon lights), is recommended during group instruction so that both Amy and Jonas can benefit. Communication partners will need instruction on how to provide verbal choices/instructions or feedback for each student, based on individual needs. According to the occupational therapist, Amy will be able to visually discriminate and physically target more than one letter or symbol per page on her personal communication system, particularly since the

arrangement will become more and more familiar over time. At first, this option may only be appropriate when other students are not moving around or making a lot of noise, as Amy has trouble with coordination due to her cerebral palsy and startles to loud or sudden sounds. She also has trouble focusing her vision, even her near vision, when there are a lot of auditory distractions. Jonas will benefit from presentation of the alphabet one letter at a time, even in settings where there are no other distractions. The team will meet to consider whether auditory cues or tactile enhancements, such as adding textures or Braille, will be beneficial. In addition to modifying their letter boards, the team will also make alphabet books that include video models of selecting letters, using verbal descriptions that have been agreed upon by the team. These videos can be used to supplement partner models, since watching another person model use of communication displays or letter boards would be too visually complex for both Amy and Jonas.

## SUMMARY

Emergent literacy is a necessary foundation for the development of conventional literacy. Students with significant disabilities with CVI need rich, authentic emergent literacy opportunities which teach them the joy and power of literacy. When designing instruction that will support students’ CVI, the learner, the partner and the environment need to be considered. Professionals need to ensure that during literacy activities, the appropriate accommodations are made so that students’ CVI needs do not limit literacy learning. The most powerful common thread across all of these concepts is the power of the social interaction with others around personally meaningful accessible materials for many different types of literacy activities. With these things in place, there can truly be literacy learning for all!

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# UPCOMING LIVE WEBINARS

IACET CEUs are provided by the AAC Institute and are available for live webinars at no additional fee (does not include sponsored webinars unless noted).



## **Rockin' in the Real World – Music for All**

By Mark Coppin, *.Ed., ATP, ADE, Director of Disability Services, North Dakota State University, Fargo, ND.*  
Tuesday, October 22, 2019  
3:30 pm – 5:00 pm Central Daylight Time

Includes 0.2 IACET CEUs

The ability for all students to express themselves through music is extremely important. If a student can't hold an instrument, play an instrument, read or write music; how can they express themselves musically? Luckily there are a lot of solutions available. This webinar will focus on some of those options.

We will look at accessible solutions such as Skoog, Skwitch, Beamz, Garageband and iPad apps. We will cover solutions from basic cause and effect music apps all the way to apps for composing and performing. Participants will learn how to unleash the inner Rock Star!



## **3-Part Series Beyond 90/90/90 – Supporting Students with Complex Bodies While Increasing Independent Tasks and Access**

By Karen Kangas, *OTR/L, Nationally Certified, State Licensed Occupational Therapist; Seating & Positioning & Mobility Specialist, Assistive Technology Specialist; Adjunct University Faculty, Clinical Educator, Consultant, Camp Hill, PA.*

Includes 0.6 IACET CEUs

This is a consecutive 3-part webinar series, package includes access to each webinar.

### **Session 1 – The Physiology of Seating vs. the Physics of Sitting**

Tuesday, November 5th, 2019  
3:30 pm – 5:00 pm Central Standard Time

This first webinar will focus on the true physiology of seating and positioning. Unfortunately, most therapists have been taught to look at equipment and the student at a single point in time, as was developed as an assessment process in seating clinics for adults. However, seating is not a single point in time, nor a single position, but rather a range of postures within activity, developing within every child within their environment.

Since students with complex bodies are usually not mobile or have limited independent mobility, static postures are frequently expected. It is time to expand our knowledge of active seating and its impact on task engagement. Today we will focus on how this can happen, and what we need to learn about our student's bodies to support them in increasing their repertoire of control.

### **Session 2 – Implementation Strategies & their Underlying Concepts**

Tuesday, December 3rd, 2019  
3:30 pm – 5:00 pm Central Standard Time

This second webinar is built on the first one. Now let's take what we learned in the first session and put it to use with real students. Observing a student's postural mechanisms is challenging. These can only be observed when the student is engaged in tasks, and frequently it is that very engagement that is not occurring. How can we support activity engagement to actually observe vestibular processing?

How does the actual environment itself impact the student's engagement and/or our ability to observe their experience with sensory processing? How do we analyze this environment and how might it change to support self initiation?

### Session 3 – Let's Get to Work! The Journey Required!

Tuesday, January 7th, 2020

3:30 pm – 5:00 pm Central Standard Time

This final webinar is based on the previous two in consecutive order. Today we want to explore how we can create the journey and critical pathways we need to utilize for seating and positioning within each classroom for each student for support of increased task engagement.

How do we create an assessment which not only observes the student, but also observes the environment and their interactions? Where do we start when we know we need to change, and we face such a challenging hurdle of multiple staff, lack of equipment and the challenge of limited time?

This webinar will share the actuality and real methods to get started and keep going. This will help therapists develop a plan to create increased self initiation within the classroom today, and in the future. This whole process is a process not just for our students, but a journey and a road we need to be on together.



#### Literacy for Students with Multiple Disabilities

By Jennifer Schroeder, *Multiple Disabilities Specialist, Deaf-blind Specialist, Special Education Service Agency, Anchorage, AK.*

Monday, November 18, 2019

3:30 pm – 5:00 pm Central Standard Time

Includes 0.2 IACET CEUs

This webinar will focus on teaching how to develop a comprehensive literacy program for students with cognitive impairments, multiple disabilities and physical impairments. The presenter will review different strategies, as well as different ways to gauge learner understanding and engagement. The presenter will use specific visual supports and equipment that can help learners engage in a well-rounded literacy program throughout their day.

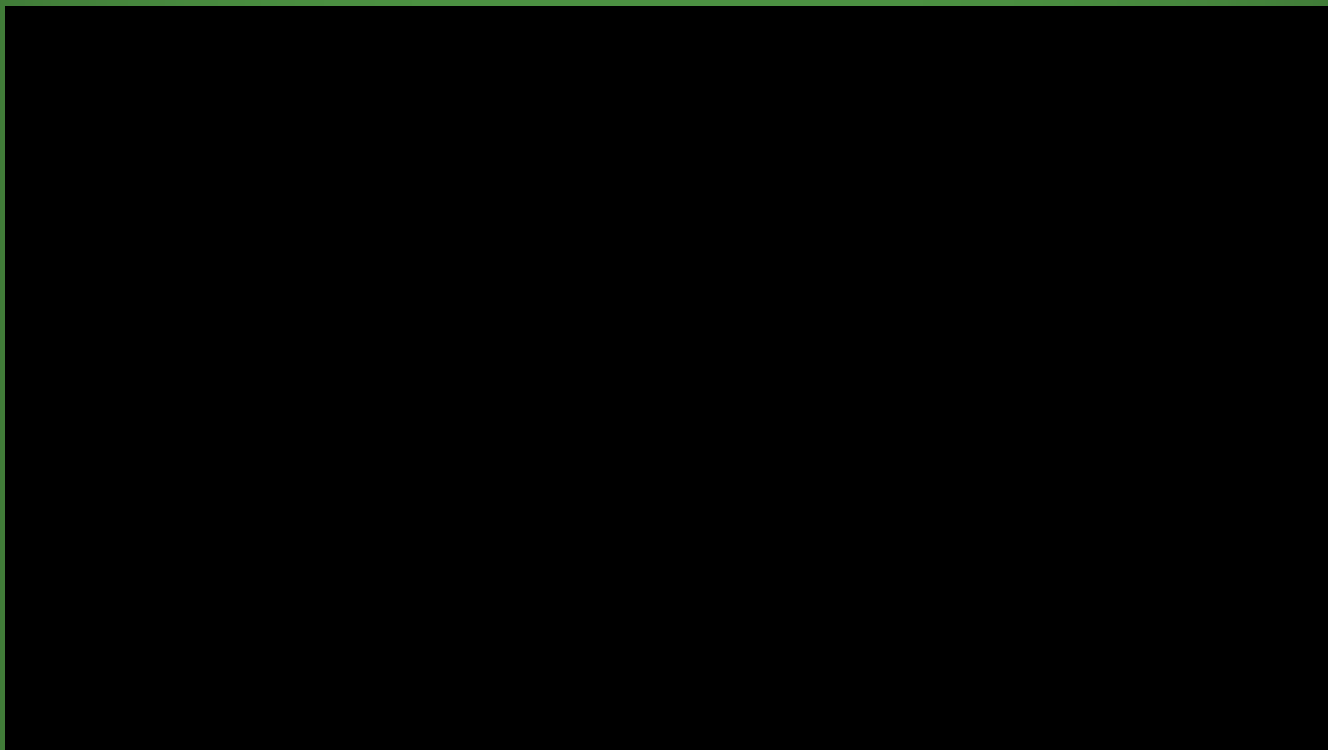
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# Empowering Paraeducators

## The Key to Successful Implementation

Research indicates that Aided Language Stimulation is a highly effective strategy to support students learning to communicate using an Augmentative Alternative Communication (AAC) device. AAC Specialists and Speech and Language Pathologists (SLP) work diligently to increase opportunities for success by modeling language-using AAC for students. Many states have built in training for families following an AAC evaluation to increase competency. Primarily the focus has been on working with special education teachers to increase awareness, support vocabulary development and to create engaging lessons to increase communication opportunities. Sometimes, training is given to paraeducators as well. Sometimes?

For the past two years, my colleague Candice Steel- SLP-L, ATP, and I have been researching and developing paraprofessional training specifically focused on AAC. When we first started this journey, we discovered that too often, paraprofessional training was left up to the teachers and squeezed into the few precious minutes before and after school. Time appeared to be the biggest obstacle to providing paraprofessional training on AAC in school environments. In interviews with dozens of AAC Specialists, we asked what the biggest obstacle was in successfully implementing AAC in their schools. The responses were consistent and listed lack of follow through, lack of staff buy-in or motivation, lack of modeling and the abundance of different systems in one class. Our conclusion was that all of these concerns could be alleviated through systematic training for staff focused on adult learning models. What kind of impact could we have if we started training paraeducators?

### COMMUNICATION PARTNER

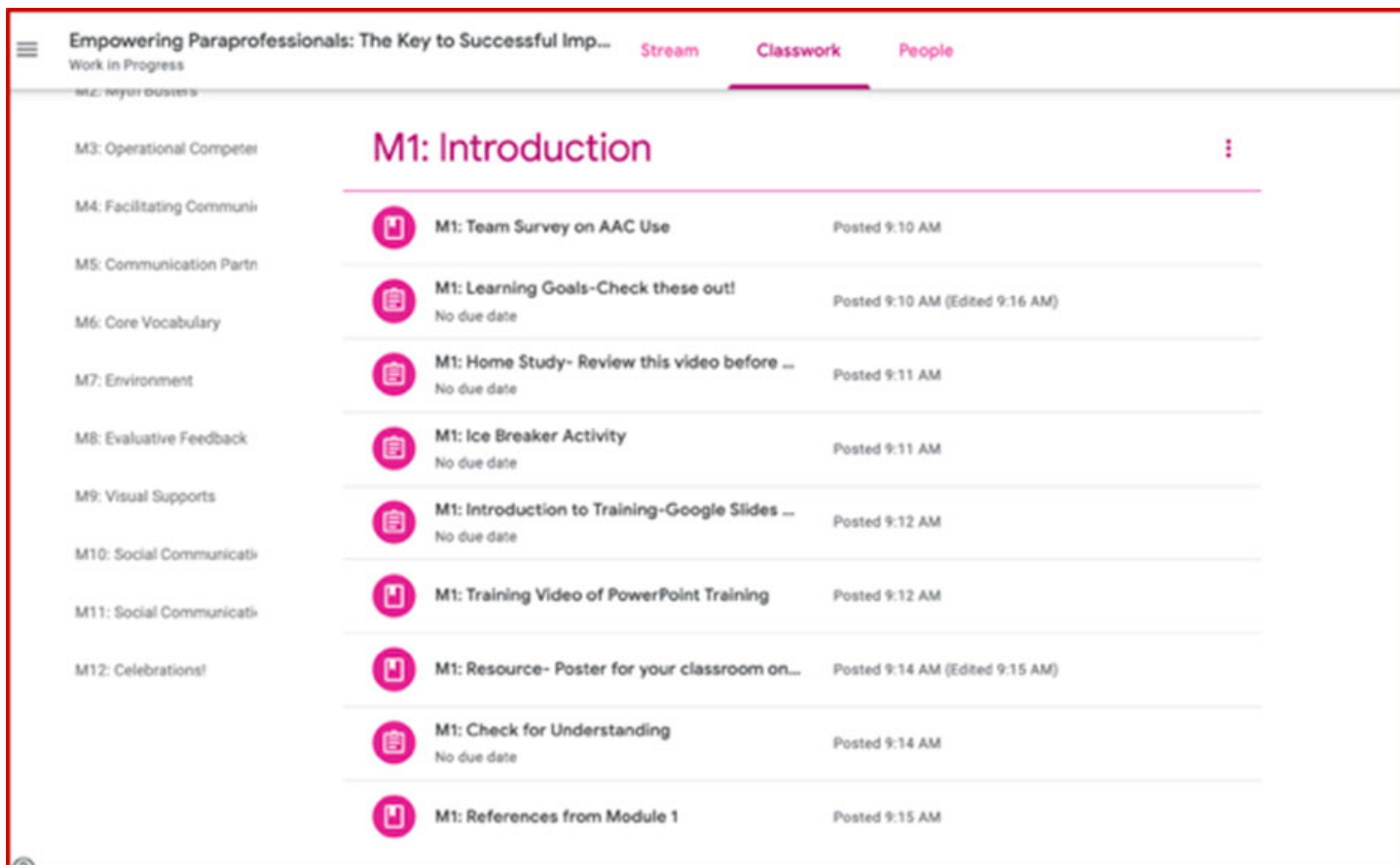
Paraeducators, or Paraprofessionals, play a vital role in the education of many of our students that have Individual Education Plans (IEPs). It is safe to say that in many cases, paraeducators are the key person that spends the most 1:1 time with our students throughout the school day. However, of all of the possible members of the student's educational team, this is the team member that receives the least amount of training.

In 2016, The Bureau of Labor Statistics estimated that there were 1.3 million paraeducators working in our schools. Often, the role of a paraeducator is to provide support to teachers and students with significant disabilities and health care needs. Who trains the paraeducators? When, and how often, varies drastically from state to state and from district to district. When training is provided, it's often focused on safety and health care needs. How many of these paraeducators are supporting a student that needs AAC?

Opportunities to develop language proficiency for students using AAC are greatly influenced by the student's support team, especially the paraeducators. According to a 2011 literature review by ASHA, some of the essential factors to reduce AAC device abandonment include team support, access to ongoing training, and appropriate expectations from a user's communication partner. Ensuring success depends on a number of factors including student buy-in and follow through supported by school teams. Implementation is one of the major challenges of educators and teams everywhere. As the most significant communication partner for students using AAC, shouldn't there be



**JEANMARIE JACOBY** M.Ed., Jeanmarie has over 32 years experience in the field of special education. She began her career as a special education teacher in the Boston area and is now living in Phoenix, Arizona. Jeanmarie earned her master's degree in special education and holds a graduate certificate in Assistive Technology Applications from CSUN. Her many roles in special education include Special Education Teacher, Program Specialist, Assistive Technology Specialist and Adjunct Instructor at Grand Canyon University and Northern Arizona University. Jeanmarie has provided trainings and workshops for parents and educators nationally and internationally. She is passionate about advocating for students with disabilities, mentoring new teachers and providing training for parents and educators in an effort to make the world a more inclusive environment for everyone.



Snapshot of Module From Empowering Paraeducators Google Classroom

evidence-based training for paraeducators?

## DISEMPowerMENT

Stephanie Faso is a graduate student at San Jose State University working on her Master's degree in communication, specializing in the cultural communication of people with significant physical and speech differing abilities. Ms. Faso is also a lifelong user of AAC. Her research includes how support systems influence individuals with complex physical and communicative differences. In her thesis, she concludes through research, that support systems disempower individuals with complex and communicative differences by not having enough knowledge about the details of the communication devices, by being unwilling to work with the individuals to communicate using the device, and by denying the potential abilities of those using the devices.

Research by Light, Collier, & Parnes, 1985: and by Blackstone, 1999, outline patterns of ineffectual responses by paraeducators. Their research cites paraeducators working with students using AAC and doing the following:

- Paraeducators limiting questions to yes/no response.
- Providing few opportunities of communication and missing opportunities to create communication.
- Using large number of prompts (verbal, physical, and ges-

tural).

- Taking the majority of the turns in communication.
- Focusing excessively on the technology or technique and less on the message.

These responses can result in limited progress, prompt dependency and of course, an escalation of behavior, not to mention device abandonment.

Do these responses look familiar? Do you see similar results? Are you convinced of the need for paraeducator training yet? We were!

At my practice in Phoenix, Arizona, we use all of our training time to work with teachers. There are those that soak up the information and integrate strategies throughout their day. There are others that aren't as successful. "I don't understand this device!", "Too many different devices in one classroom!", "Not enough time in the day to train the staff." My colleague is a sixth grade special education teacher, she said, "I feel that by sixth grade, students that need an AAC device should have one and have at least some basic skills in communication. However, that is too often not the case."

Despite this, year after year, our model stays the same- we use all of our training time to support teachers and therapists. And year after year, students arrive at sixth grade without basic com-



munication or AAC skills. What can we do differently to increase student competency and independence?

## EMPOWERMENT

Candice Steel works with adults that communicate using AAC. Four years ago, she was taken back by the amount of device abandonment in the adult population. She started training paraprofessionals in a series of one-hour trainings. The results were amazing! Not only were the AAC users increasing their communication output, other staff in the room were starting to learn the strategies. The paraprofessionals she trained in her program called, “Power Partners”, modeled the talkers for the members and other paraprofessionals. Communication increased, competency increased, and staff started volunteering for the Power Partner training. Three years later, when you walk into her programs, devices are out and staff is modeling the behavior. More importantly, members are using their devices and communicating.

In schools, we see both success and abandonment. We hail the successes and work to support those classrooms where the teacher and paras have supported their students to become effective users of AAC. Clearly these teams are knowledgeable, trained in Aided Language Stimulation and value the importance of creating opportunities to use AAC. The challenge is to reach the teams that aren’t seeing progress. Our students are counting on us to investigate and implement change!

Within the schools, we do not have the luxury of time built into the paraeducators schedule to provide one-hour trainings. When I approached my supervisor about giving time for training, there was a definite, “no” response. I could train the teachers or I could have 15 minutes before school started or at the end of the day. Fifteen minutes was a start.

Determined to reach these classrooms, I started my research. Though there was a plethora of resources available, there were but a handful of programs focused solely on training paraprofessionals to work specifically with students using AAC. There are several online programs, with one of the most well-known, from Pennsylvania’s PaTTAN. There are similar programs offered in Connecticut, Minnesota and Phoenix all covering a range of topics from an overview of eligibility categories, academic support strategies, behavioral plans and health and safety practices. This course work is independent course work and not always supported by school districts-meaning there may not be any “reward” for completing the program. Most notably, these courses are not going to address the time constraints and require a lot of self-determination on the part of the paraeducator to enroll and complete the program.

## STARTING LINE

I partnered up with my colleague Candice, who had already had so much success training her support staff for adults using AAC. We decided to create our own 15-minute trainings. There

were so many amazing resources available from so many Assistive Technology “rock stars”. Best of all, most of these resources were free! Candice and I identified what topics needed to be covered. We started with ten topics-Dispelling Myths, Core Vocabulary, Visual Supports, Operational Competence, Engineering the Environment, Facilitating Communication and Modeling, Communication Partners, Social Scripts, Communication Stories and Evaluative Feedback. We certainly could add more topics but the goal was to get staff trained and devices in the hands of students.

## EFFECTIVE LEARNING STRATEGIES

Several studies have demonstrated what supports are most impactful. (Rispoli et al., 2011)

Instructional methods used in these studies included Instructional videos, written instructions, verbal instruction, modeling, practice, role playing and feedback.

Conscious of how adults learn and retain information, we quickly realized that we were better off breaking up the content into modules. We also knew we needed to make the information fun and engaging. Our hope was if the materials were interesting enough, that not only would we have more of a success rate with completion of the training modules, but we would also have the side benefit of the paraeducators sharing the information with other staff on their team.

## PROVIDING OPTIONS

The modules included a two-minute homework assignment to be viewed before the training and an icebreaker activity or video to start the training. We created slide presentations with notes. That way, a trainer can present the slide presentation to a group and have talking points or ask paraeducators to view the presentation independently or in small groups. For those in need of a different format, we made videos of the slide presentation. As best practices dictate, you must provide options! This also made it easy for paraeducators to review if they missed a training due to illness or if they wanted to revisit and review the training multiple times. The slide presentations are editable. Districts can add material or customize the text or pictures to address a school’s unique needs.

We decided to add resources relevant to the module topics. This promotes further exploration and points participants to free resources available. Finding out there are resources available and having the opportunity to view them only takes a minute but we had to limit the amount of resources in order to keep within our 15-minute time limit.

## EVERY GOOD LESSON NEEDS AN ASSESSMENT

We needed a method of determining if the material we were using was meeting the needs of our paraeducators. We created a Google form with questions directly related to our objectives. We didn’t want it to be intimidating as some of our paraeduca-



tors hadn't taken a test in many years. For that reason, we labeled our assessments, "Check for Understanding". Having an assessment enables administration or teachers to determine if the paraeducator understands the topic or if they need further information and training before moving on to the next module.

## AN ACCESSIBLE CLASSROOM

Our last obstacle was how to organize and present the materials. Google Classroom was our best option as our district was promoting G Suite within our schools. It made sense. Best of all, we would be teaching the paraeducators to utilize the technology we wanted our teachers and students to use. Too often we train the administrators, train the teachers, train the therapists and overlook the need to train the paraeducators (... again). Moreover, we were able to share our classroom with other districts (outside of G Suite) enabling them to download materials, make their own classrooms and copy the assessments.

## RESULTS

As mentioned earlier, this program worked great with the support staff working with the adults. I also used the trainings to train teachers, SLPA's and paraeducators. We shared the classroom with AT Trainers in Arizona, California, Colorado, Louisiana, Minnesota, New Mexico, Texas and Wisconsin. Feedback has been very positive and has prompted us to make changes. We added separate objectives for participants to view before starting each module. We changed the order in which we presented each topic. Additionally, two more modules were added to the classroom.

We felt we needed to add an introduction module to show participants how the trainings would work and how un intimidating they were! We wanted to start them off with a bang and build enthusiasm while also conducting a powerful activity to start this experience.

In addition, a 12th module was added to recognize their elevated knowledge. The 12th module is called "Celebrations", and takes time to acknowledge their accomplishment but also outline their responsibilities moving forward. The expectation is not only that they promote the use AAC into the daily lives of their students, but also it is expected that they empower their teammates by sharing their new expertise in augmentative and alternative communication strategies.

There are many school districts that are successfully implementing AAC into their school day. There are even more SLPs, therapists, AT Trainers, Special Education Teachers and parents that made it their personal mission to keep informed and utilize research-based strategies to increase outcomes for the students they work with. For Candice and I, this project was about the underserved, under informed and untrained paraeducators. This was for the educational teams that needed access to resources in a condensed, time sensitive platform. This project focused on the motivated caretakers that craved information but had diffi-

culty navigating through the wealth of information available. It is possible to deliver training and information even in the smallest increment of time slots. This project was for our paraeducators and for those educators that believe that investing in our paraeducators will exponentially increase our outcomes for students using AAC. Empowering our paraeducators can be the key to successful implementation.

Free samples of this project are available upon request.

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# Through the Occupational Therapy Lens



**FROMA JACOBSON** is an Assistant Professor for Midwestern University's Occupational Therapy Program. She received her Bachelor of Science degree in Occupational Therapy in 1970 at the University of Southern California and her Master in Education from Arizona State University in 2003. Her practice has included direct client service, program development, systems change, management with supervision, product development and teaching pre-service students and post-service professionals. This visionary imagined, developed and directed the AT service delivery model at the Arizona Department of Education and was a founding member of of State Leaders of Assistive Technology in Education. She is recognized as a pioneer (since 1976) in the development and implementation of the role of Occupational Therapy in Augmentative Communication and later in all the Assistive Technology solutions available to adults and children. She has presented at numerous local, state, national and international conferences and post graduate educational venues on various topics pertaining to the role of Occupational Therapy in Assistive Technology and Universal Design. The professional community recognized froma as the recipient of the Arizona Occupational Therapy Association Distinguished Achievement Award in 1997 and the Arizona Council for Exceptional Children for Distinguished Service to Exceptional Children in 1991. Ms. Cummings began her career at Midwestern University in 2009 following her position as Clinical Associate Professor and Coordinator of the Certificate in Assistive Technology and Accessible Design at the University of Wisconsin, Milwaukee.

Occupational Therapy (OT), my chosen profession, has recently celebrated our centennial year, and I am fortunate to have been practicing for almost half of that. My engagement in the equally broad field of Assistive Technology began on February 4th, 1976 and continues to evolve. Please allow me the opportunity to reminisce on what I consider the three stages of my developing professional journey and the role OT has played and continues to play on the transdisciplinary team for persons whose engagement in meaningful occupation can be enhanced by specialized technology.

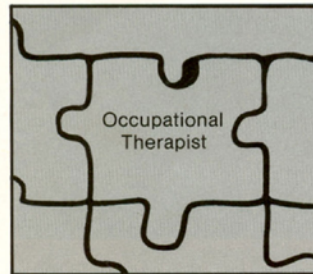
## STAGE 1

I hopped into the golden opportunity to look at Assistive Technology (AT) through the OT lens in 1976 as a young clinician working at Plavan School at Fountain Valley California when Dr. Judy Montgomery, PhD., SLP-CCC successfully wrote the grant to open the Non Oral Communication Center. Understanding the infancy of AT as we know it today and the confusion about OT, I, at that time, attempted to write an article bringing understanding to the role of OT on the team. This article, included here in its entirety, was published in the Zygo Resources Magazine circa about the 1979.



by Froma Sadacca, Occupational Therapist, Registered, Private Practice, Huntington Beach, California

*(An experienced specialist presents her outline for active occupational therapy intervention with the non-oral population—a call for action in a rapidly growing, new field.)*



The skills of the Registered Occupational Therapist (OTR) are both diversified and specialized as he/she has been trained in the medical, psycho-social, educational and creative frames of reference. Expertise in specific modalities and general problem solving approach to a client's assets and liabilities necessitates this specialist's inclusion in any inter-disciplinary team structured to treat the "whole" person.

To help you become more cognizant of the occupational therapist's input and contributions to the team approach to therapeutic intervention, attention here will be directed to educational background, treatment skills and ability to allow the physically handicapped, non-oral client to access augmentative communication systems.

### Professional Training

Occupational Therapist, Registered, is a professional designation awarded

upon achievement of an acceptable score on the Certified Examination for Occupational Therapist, Registered. To become eligible for this exam, one traditionally completes a course of study (undergraduate or graduate level) including liberal arts, anatomy, physiology, neuroanatomy, neurology, kinesiology, human development and adaptations, occupational behaviors and roles, medical lectures, sensory integrative dysfunction and occupational therapy theory and skills. Class work is followed by a minimum of six months' internship. Training is comprehensive, asking one to draw from principles from many basic areas for application and treatment techniques.

### Treatment Skills

The occupational therapy treatment plan is by necessity customized to the needs, assets and liabilities of each client. There are certain areas common to the evaluation and treatment of severely handicapped, non-oral clients—encompassing gross and fine motor skills, positioning and adaptive equipment, visual perception, developmental stimulation, activities of daily living and vocational rehabilitation. The end goal is to help the client achieve maximum potential towards normalized function within physical, emotional, behavioral, intellectual and developmental limitations. Part of this independence for which we are striving is in communication. Table I suggests areas of function incorporated into a typical occupational therapy evaluation—treatment—re-evaluation model for a physically handicapped, non-oral person.



TABLE I

<p><b>Motor</b></p> <ul style="list-style-type: none"> <li>positioning</li> <li>adaptive equipment</li> <li>splinting</li> <li>gross skills</li> <li>fine manipulation</li> <li>sensory integration</li> <li>neuromuscular developmental facilitation</li> <li>specific/non-specific</li> <li>switch operation</li> <li>reliable, consistent output</li> <li>primitive reflex patterns</li> <li>interface selection/training</li> <li>range of motion</li> <li>muscle education, strengthening</li> </ul> <p><b>Visual Perception</b></p> <ul style="list-style-type: none"> <li>motor planning</li> <li>sensory integration</li> <li>visual tracking</li> <li>position in space</li> <li>spatial relationships</li> <li>figure ground</li> <li>ability to follow directions</li> <li>directionality and sequencing</li> <li>information categorization</li> <li>attention to a task</li> <li>attention span</li> <li>developmental stimulation</li> </ul>	<p><b>Activities of Daily Living</b></p> <ul style="list-style-type: none"> <li>self care (eating/feeding, dressing, personal hygiene)</li> <li>physical and emotional exercise</li> <li>leisure time activities</li> <li>communication</li> <li>money management</li> <li>transportation skills</li> <li>social skills</li> <li>some functional reading</li> <li>cooking</li> <li>sewing</li> <li>home care skills</li> <li>clothing maintenance</li> <li>mobility</li> <li>work simplification</li> </ul> <p><b>Vocational Rehabilitation</b></p> <ul style="list-style-type: none"> <li>interests</li> <li>past experiences and roles</li> <li>24 hour schedule</li> <li>time/space management</li> <li>specific task related skills</li> <li>attention to task</li> <li>speed</li> <li>reliability</li> <li>social appropriateness</li> <li>social acceptance</li> <li>motor/intellectual limitations</li> <li>practical considerations</li> </ul>
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Figure 22-5 Skills to be assessed when planning augmentative communication systems

<p><b>MOTOR</b></p> <ul style="list-style-type: none"> <li>Midline crossing</li> <li>Range of motion</li> <li>Eye-hand coordination</li> <li>Strength</li> <li>Speed-accuracy-control</li> <li>Time-energy saving</li> <li>Reliability of response</li> </ul> <p><b>ACTIVITIES OF DAILY LIVING</b></p> <ul style="list-style-type: none"> <li>Independence using communication</li> <li>Communication to enhance social, education, vocational opportunities</li> <li>Communication via phone</li> <li>Communication for emergency</li> <li>Communication for pleasure</li> <li>One-to-one communication</li> <li>Group interaction</li> <li>Communication to order products</li> </ul>	<p><b>VISUAL PERCEPTION</b></p> <ul style="list-style-type: none"> <li>Spatial relationships</li> <li>Position in space</li> <li>Figure-ground</li> <li>Visual tracking</li> <li>Directionality</li> <li>Ability to follow directions</li> <li>Eye contact</li> <li>Symbol permanence</li> <li>Cause-and-effect relationships</li> <li>Timing</li> <li>Sequencing</li> <li>Spelling</li> <li>Reading</li> <li>Word recognition</li> <li>Decision making</li> <li>Problem solving</li> <li>Visual-auditory memory</li> </ul>	<ul style="list-style-type: none"> <li>Visual pursuit</li> <li>Visual-auditory discrimination</li> <li>Attention span</li> <li>Attention to task</li> <li>Risk taking</li> <li>Information categorization</li> <li>Information finding</li> <li>Visual matching</li> <li>Motor planning</li> </ul>
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*These ideas were further developed in a chapter I authored in 1985. Yet again, in 1989 I reiterated what we had learned in the past 10 years – essentially the same best practices focusing on the ‘new developing technology of the times.’ You will note that my name has evolved from Sadacca to Jacobson.*



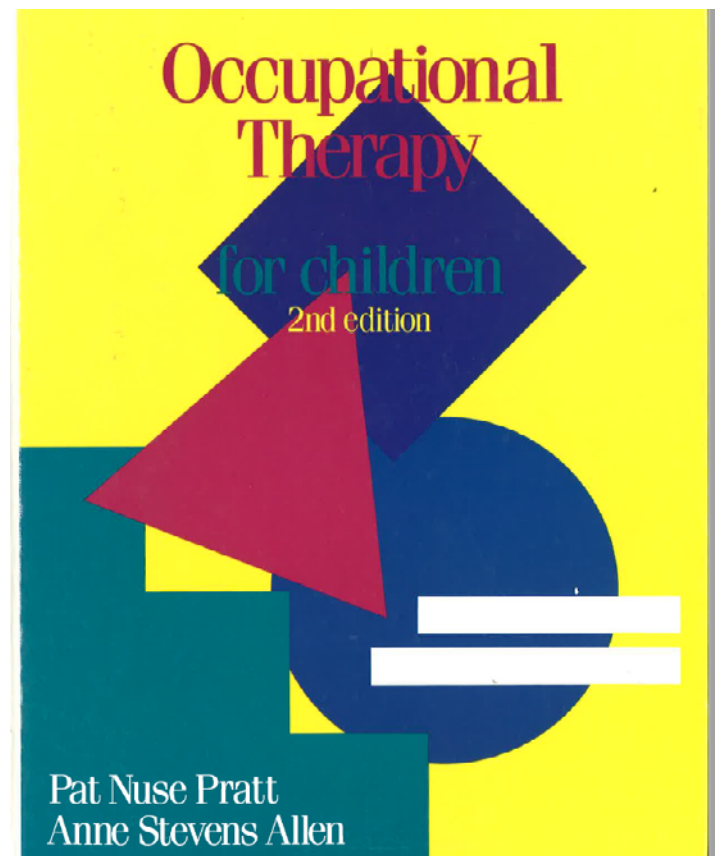
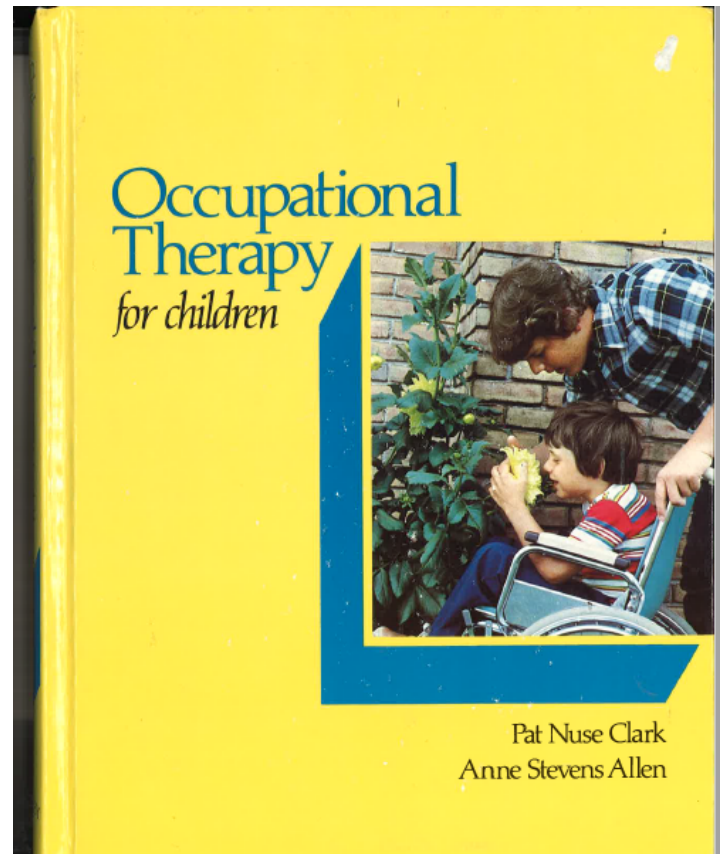
Figure 22-7 Computers allow children to communicate their choices and play otherwise inaccessible games.

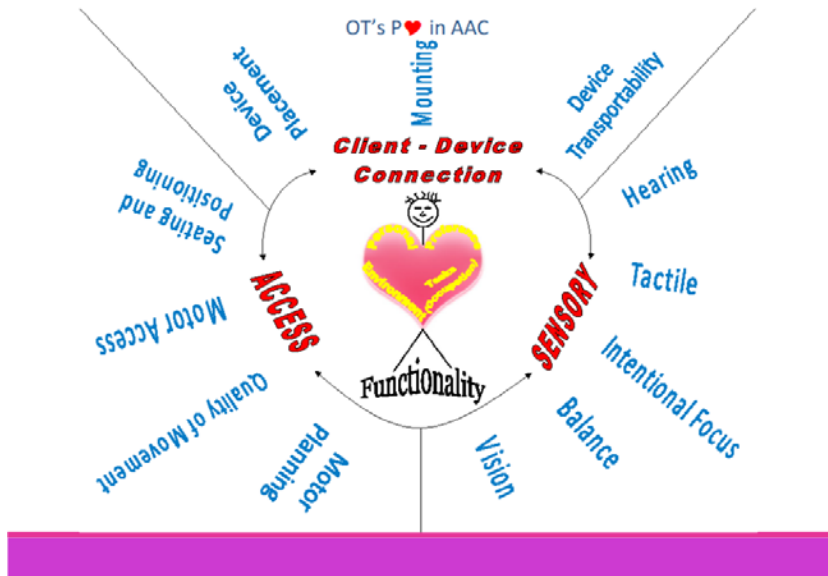
(Cummings, f. 1989)

In review today, thinking back at the development of our field and my experiences working at such centers as the Non Oral Communication Center with Judy, Loma Linda University with Mel Cohen, Systems and Programs to Enhance Augmentative Communication (SPEAC) at Upward Foundation Phoenix with Mary Christen, Zygo Industries and moving forward, the role of OT as a team member has not significantly changed.

## STAGE 2

Fast forward to 2005: I am now the Director of Assistive Technology and Accessible Instructional Materials at the Arizona Department of Education. Our service delivery model, not dissimilar to other statewide delivery programs such as WATI, PIAT and TATN, was to service the needs of the children through building capacity in school personnel. Individualized education program (IEP) team members were struggling to consider the need for Assistive Technology for all students during the IEP process, and at the state level, we attempted to supplement team trainings with 'easy to do' ways to advocate for students. I carried the challenge forward, attempting to create a way OTs could effectively look at a student and make meaningful contributions – even an OT who did not share my passion for AT. In 2007, I joined the faculty at University of Wisconsin-Milwaukee and partnered with Dr. Shelley Lund to develop a speech and language pathology and occupational therapy team at Milwaukee Center for Independence. While working with her, Dr. Roger Smith and Dr. David Edyburn, I continued to brew the idea of a cheat sheet summary for OTs working with persons with complex communication needs. In February of 2010, while teaching at Midwestern University – Glendale, I collaborated with the AT team (Barbara Hendrickson, OTR/L and Jolene Madden M.Ed., CCC-SLP) in the Scottsdale Unified School District to develop and disseminate the following protocol:





## SENSORY

<p style="text-align: center;"><b>Vision</b></p> <p>Using collaboration with vision specialists, file review, observation and information provided by client (or circle of support), assess visual limitations and/or sensitivities relevant to the use of AAC.</p> <p><b>Thinking Points:</b></p> <ul style="list-style-type: none"> <li>• Lighting/glare</li> <li>• Size</li> <li>• Color</li> <li>• Message representation</li> <li>• Visual tracking</li> <li>• Figure ground differentiation</li> <li>• Visual field (and limitations)</li> <li>• Blind spots</li> <li>• Visual corrections (indicate one of both eyes)</li> </ul>	<p style="text-align: center;"><b>Intentional Focus</b></p> <p>Assess ability to participate in conversational turn taking with elements including but not limited to listening, knowing when to speak, waiting, activating, holding, releasing, time planning, motor fatigue and attention to task amidst environmental factors.</p> <p><b>Thinking Points:</b></p> <ul style="list-style-type: none"> <li>• Scenes</li> <li>• Visual/Auditory Stimulation</li> </ul>
<p style="text-align: center;"><b>Hearing</b></p> <p>Using collaboration with hearing specialists, file review, observation and information provided by client (or circle of support), assess visual limitations and/or sensitivities relevant to the use of AAC.</p> <p><b>Thinking Points</b></p> <ul style="list-style-type: none"> <li>• Hearing limitations (consider preferred volume, voice, speed of communication, inflections, etc.)</li> <li>• Hearing sensitivity (consider preferred volume, voice, speed of communication, inflections, etc.)</li> <li>• Ability to differentiate message from background noise</li> <li>• Hearing corrections (indicate one of both eyes)</li> </ul>	<p style="text-align: center;"><b>Tactile</b></p> <p>Using collaboration with the client's circle of support and the client, assess tactile defensiveness or need for tactile input (pressure, proprioceptive, kinesthetic, etc.) relevant to the use of AAC.</p> <p><b>Thinking Points</b></p> <ul style="list-style-type: none"> <li>• Startle Response to Output</li> <li>• Defensiveness</li> <li>• Awareness of Position in Space</li> <li>• Sensory Needs</li> <li>• Adaptability to Tactile Motion</li> </ul>
<p style="text-align: center;"><b>Balance</b></p> <p>Observe the client walking naturally across various surfaces with focus on stability, balance and weight shift especially while transporting an object from one height to another. If necessary ask client to carry something from one strategic area to another with obstacles and height differences while observing for preparation to take object, carry, put down and release with emphasis on safety to the client throughout the process.</p> <p><b>Thinking Points:</b></p> <ul style="list-style-type: none"> <li>• Recovery/Shifting Weight <ul style="list-style-type: none"> <li>➢ Repositioning</li> </ul> </li> </ul>	<p><b>Other Notes:</b></p>

# ACCESS

## Quality of Movement

Observe the client at strategic times of the day (morning/night, energized/fatigued, high vs. low cognitive load, various settings) to understand movements, patterns and overall quality of movement

### Thinking Points:

- Repeatable, controlled and intention movement
- Tone (hypotonic, hypertonic, mixed, etc).
- Endurance
  - Strength
- Fatigue
  - Range of motion
- Dexterity
  - Overflow

## Motor Planning

Observe and assess gross motor, fine motor and organizational tasks to determine if client can seamlessly organize, plan and execute an intended motor action.

### Thinking Points:

- Organizational Strategies
- Message Representation
- Sequencing
- Navigation
- Anticipate, wait and execute within appropriate time
- Crossing midline (one and/or both directions)
- Visual memory

## Motor Access

Observe, listen and collaborate to determine most functional, reliable and repeatable motor input for seamless perceptual-motor input to the device to the degree that motor function does not impede functional expressive communication.

### Thinking Points

- Direct
  - Touch Enter/Exit, Morse Code, Mouse, EyeGaze, Head Pointing, Head Mouse
- Indirect
  - Single/Multiple Switch, Visual Scanning, Auditory Scanning, Joystick

\*For scanning, focus on ability to wait, activate, hold, release, motor release and sensory/cognitive vigilance as suggested by Bukelman and Mirenda (1992)

## Seating & Positioning

Observe the client at strategic times of the day (morning/night, energized/fatigued, high vs. low cognitive load, various settings, rest and intention) to understand movements, patterns and overall quality of movement

### Thinking Points

- Comfort
- Positions Throughout the Day
- Functionability

# CLIENT ~ DEVICE CONNECTION

## Placement

Assess and observe device placement that yields 1) most accurate access for the extended period of time and 2) most functional communication. Note: observe person engaged in similar motor and cognitive tasks throughout the day for information on 'what works' for placement.

### Thinking Points:

- |                              |                              |
|------------------------------|------------------------------|
| • Device                     | • Switch                     |
| ➢ Midline (left or right of) | ➢ Midline (left or right of) |
| ➢ Tilt                       | ➢ Tilt                       |
| ➢ Height                     | ➢ Height                     |
| ➢ Distance                   | ➢ Distance                   |

## Availability

Collaborate with the client's circle of support to plan for successful functional communication using an AAC device. Ongoing conversation will focus on consensus of issues including but not limited to: 1) when and how the device will be used, 2) educating communication partners, 3) responsibility for customization and 4) maintenance (including charging). It has been proven most effective to document decisions and schedule follow along and follow up to provide effective communication opportunities for the person using the AAC device!

### Thinking Points:

- Support
  - Community
  - Family

## Mounting

Consider and apply what is known about the client's vision, mobility, access method, proprioception, method of transfers, safety, environments and sensory needs, to determine the correct placement of the device and switch(es).

### Thinking Points

- For Device
  - Rolling, Chair, Desk, Wall
  - Folding, Swing-away, Rigid, Custom
- For Switch
  - Flexible
  - Static

\*if in doubt about how, where and when to mount, please contact the device, wheelchair, and/or mounting representative.

## Other Notes:

First Draft ~ 2-15-10

Developed by Froma Cummings, M.Ed., OTR/L, Assistant Professor, Midwestern University in collaboration with Barbara Hendrickson, OTR/L and Jolene Madden, M.Ed., CCC-SLP, Scottsdale Unified School District

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## STAGE 3



I met Laroncita when I was at Gompers Habilitation Center, Phoenix, Arizona, visiting with the members to gather occupational narratives as part of a case study project in a community based learning environment for my graduate level OT students at Midwestern University - Glendale. Candice M. Steel, SLP-L, ATP and I were teaming to demonstrate the transdisciplinary approach within the SETT mindset to enhance engagement in meaningful occupations with persons who use augmentative and alternate communication strategies. Having known Laroncita from previous visits, I expected she would be using eye gaze to input her AAC device.

Prancing towards the area I expected to find this self-directed woman, I so eagerly expected an interaction that would provide my graduate students insight into the intentional relationship and example after example of how this member enjoys and participates in activities across all areas of communication. Instead, we found a young woman sitting asymmetrically in her wheelchair, without her device or mounting system: Her head was supported by a pillow placed about six weeks previously and her communications were limited to no tech strategies.

Candice and I tag teamed, demonstrating complete role transparency had there been a trained observer and explaining the purpose of our visit to Laroncita, while attempting to understand rationale for the absence of her device. She, using total communication strategies, told us she did not want to speak with us and did not want to use her high tech eye gaze input system. Candice and I respectfully listened but picture three self-directed persons in this interaction, two trying to understand 'what is going on here and how can we fix it?' Laroncita, through education and advocacy attempts from the professionals, acquiesced and allowed us to charge and mount her device that we found in the transport bag across the room.

Through the discovery process, we concluded that her eye

calibration had become misaligned when her new head support was placed, and she had been rejecting the system since she perceived that it no longer worked for her. This was in spite of all the efforts from the Gompers staff, professionals and caregivers to recalibrate the system and make her device and expressive language available to her. My observations, through my OT lens and thoughts previously described regarding perceptual motor access, saw possibilities for scanning that could potentially afford faster communication and easier, more fail-safe set-up in the environment. I suggested the possibility and educated as best I could: In the climate of disappointment and unsuccessful access, Laroncita did not yet trust me and we ended our time together.

One week later, after additional collaboration, the yet more determined Candice and from a tag team (OT and Speech) re-approached. Laroncita also had had time to reconsider her access and need for reliable repeatable access methods to meet her communication needs through the day and across all areas of occupation. When she gave us the go ahead to show her additional access methods, it was all systems go full steam ahead. Within 45 minutes, she had a second access method, which at this emerging stage was faster and more client satisfying than her initial method; one switch row column scanning with dwell including a rigid mount for the device, flexible mount for the switch and micro light switch to the left side of the face.

Professionally relinquishing all roles in the client-centered arena, Laroncita, her body (posturing, tone and reflexes) coupled with her communication needs, guided the process. The professional brain goes on automatic, drawing on the evidence and professional experience. I would like to think I reflected and professionally referred to the articles otherwise referenced and the Occupational Therapy Practice Framework, but all I could think is "Laroncita is trusting us to get this right and we better surpass her expectations!" This is the process and professional reasoning as per best recall:

1. Visually scan the environment and understatedly gather enthusiasm and support: This is the team ultimately responsible for making communication available to Laroncita on a daily basis.
2. Appreciate and respect my professional partner, fully understanding that she and the client are trusting my eyes and professional experience. This is done with the mutual respect that I bring fresh eyes/thinking, and she is the expert on the client and what is pragmatically available within the environment.
3. Watch and observe. At this junction, my eyes watched the member's tone, reflexes, motions and motor patterns as we engaged in no tech total communication strategies. While her gross posture shifted and she appeared to demonstrate numerous unintentional motions, she seemed to have reliable, intentional, repeatable ability to move her head to the side and to the left. It also appeared that she could return to



the original position without extraneous moments or overflow in other area of her body.

4. We explained to Laroncita what we thought her body was telling us and asked permission to go to the next step. With her permission, I held my hand to the left side of her face and asked that she touch it on command. She seemed to do this effortlessly, with minimal delay, and ability to return to neutral position.
5. Again, with permission, we offered a switch. We did not have access to a full range of switches but did find a minimalist switch. The member, at this point onboard and apparently hopeful, reliably, repeatedly and with minimal fatigue accessed the switch, searched for it as necessary, released and returned to midline and retouched seamlessly and with intentionality.
6. The next stage was to mount the interim switch to guarantee that the overzealous I, who at this point was doing the happy dance, was not responsible for the accurate timely hit/release patterns we had observed. We located sufficient sections of the flexible modular hose mounting with mount plate (plate was larger than preferred but that which was available). While I held the switch, Candice got it positioned just right and we both stood back: Laroncita demonstrated continued and continuing ability to hit and release a single switch to the left of her face. Overflow and fatigue were not factors.
7. The familiar device was mounted at eye level for scanning, not to block eye contact for communication and navigation through the building. Laroncita was previously familiar with the communication targets and layouts, and this hastened mastery. After minutes communicating using simple scanning, she quickly progressed toward single switch row column scanning with dwell. Although the OT - SLT ATP team may have moved her to a more complex speed enhancing scanning array, row column scanning was the client's preferred array. She spoke for over twenty minutes with full attention to the screen – she even spoke while we were setting up the system!
8. Laroncita quickly spoke "I am excited" and asked to be taken to see her favorite care provider in another room. This person was absent that day, but the member initiated conversation with everyone she saw on the way!



A). Person with motor access challenges and complex communication needs.



B). Note communicative intent and total communication strategies, while Candice Steel, B.S., SLT, ATP is re-calibrating eye gaze input.



C). Example of page she had previously accessed using eye gaze.



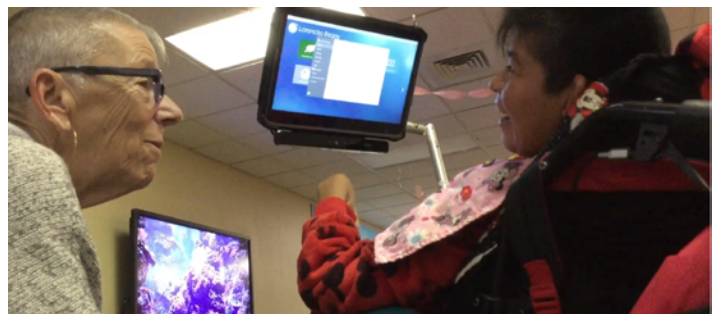
D). Screen showing eye gaze calibration: What follows is transdisciplinary conversation if eye gaze, head pointing or scanning OR combination of will afford greater communication opportunities and what the client's environments can consistently support.



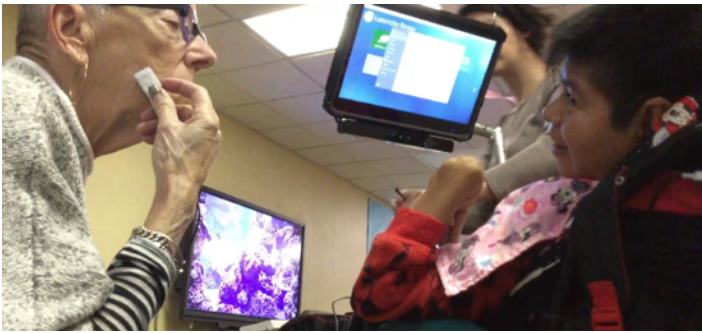
F). Watching the client, her movements, intentionality, excursion, tone, reflex patterns, etc., while at the same time thinking forward about switch selection and possible mounting.



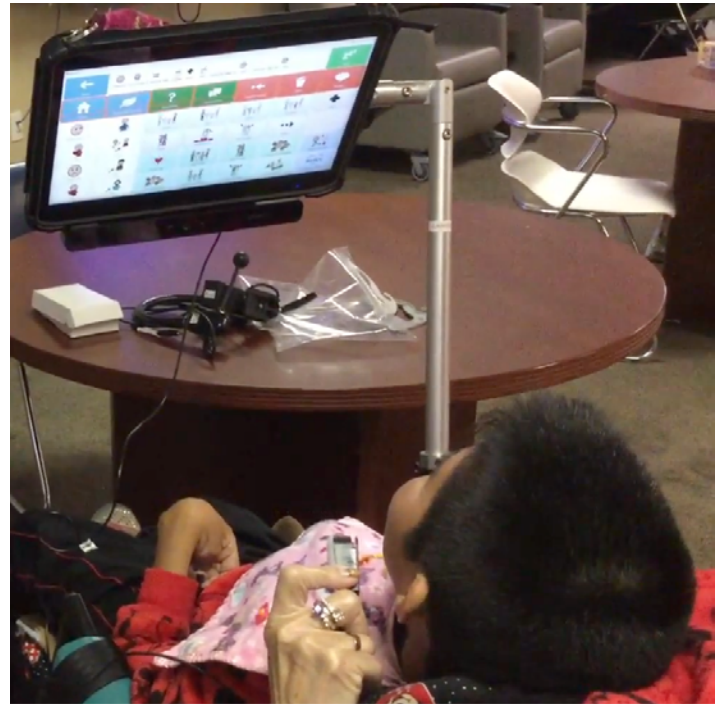
E). Head pointing is trialed next in response to client's preference in combination with perceived ability of classroom personnel to set up each day. Note that device is not mounted yet. Instead, OT and ST are assessing placement to maximize opportunities for successful access.



G). More watching while using the intentional relationship to build trust and educate the team.



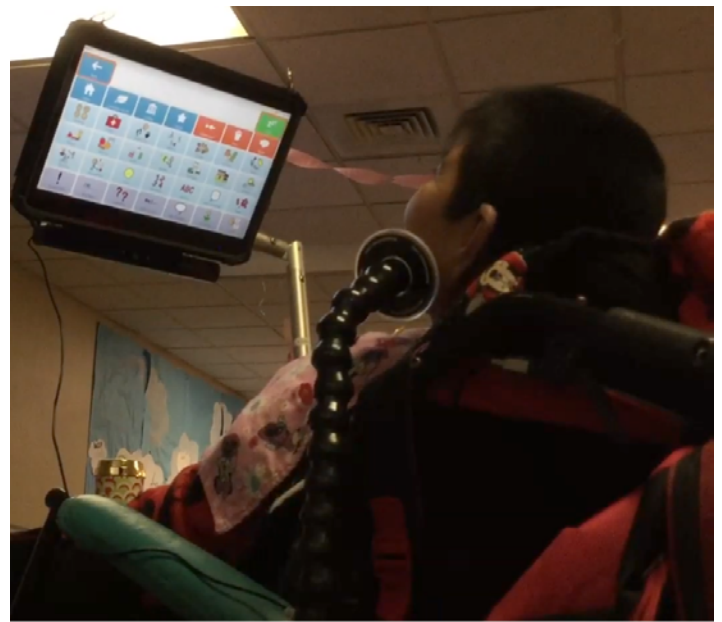
H). Access site for initial attempts at row column scanning has been determined by using clinician's hand prior to switch. This switch has been chosen because of its lightness and availability. Clinician is demonstrating before asking permission to place switch to the side of the client's face.



J). Note how her body has relaxed as the task became more familiar. Her speed and expression is greater than she had achieved using eye gaze. Laroncita independently left her communication pages and launched YouTube. Staff members gravitated over to see what was occurring, so we achieved buy-in through her success and ongoing attention to task.



I). Within the first five minutes, client initially hit and released the switch to accurately hit the intended choices without overflow. She used total communication strategies, including the device, to say she was happy. She added speed, self-corrected and combined targets to create longer sentences. She did not want to add an extra switch to make a choice and her preferences were respected, though she was educated about other possibilities.



K). We created a temporary mount – we were not yet convinced that the placement was exact but the client was so excited that she spoke throughout the process and hurried us so she could go talk to someone in another room. She initiated conversation with everyone she saw along the way. Note her relaxed body posture.

As an academic, I cannot help but reflect on all the learning opportunities from this short scenario:

1. Trust yourself, your scope of practice, the evidence behind our professional bodies of research and what we have learned from the professionals and clients with whom we have interacted. Ethically and assured that you are doing no potential harm, use what you are seeing to give your client all that you've got.
2. Respect the importance of the environment - seek support and buy-in from all the players for the benefit of your client. Know what you don't know and seek help and collaboration from resources in your physical and virtual communities.
3. Be client centered - invoke the intentional relationship to educate but always inform, problem solve, advocate and ask permission.
4. Whereas AT may seem like a specialty, reflecting back to the OT scope of practice traced as far back to my initial thoughts in the Zygo Resources article, this is exactly what we do. It's reflected throughout the OTRPF.
5. And lastly, for anyone who thinks they will "not do AT," kindly be advised that person after person will come to you in your broad scope of practice who are users of no tech through high tech devices - it's our professional responsibility to be informed.

#### REFERENCE:

Cummings, F. (1989). Children with communicative impairment. In P. Nuse Pratt and A. Stevens Allen (Eds.), *Occupational therapy for children*, (2nd ed., pp. 442-456). St. Louis, MO: Mosby.

Jacobson-Sadacca, F. (1985). Children with communicative impairment. In P. Nuse Clark and A. Stevens

Allen (Eds.), *Occupational therapy for children* (pp. 349-358). St. Louis, MO: Mosby.

In closing, thank you so sincerely to all of you who have and continue to contribute to my journey to live and assist others to live life to the fullest using no tech through high tech strategies amongst all the various tools in my OT toolbox. ■



# DISKoveries

## New and Noteworthy iPad Apps

For more detailed information, pictures and videos, see developer's website, Apple and Google Store, and YouTube.

**KEY**

\* - A Free or Lite Version or Trail is available  
 A - An Android version is available

**APPS**

PRODUCER/WEBSITE	KEY	BRIEF REVIEW
<b>Smarty Ears</b> <a href="http://www.smartyearsapps.com">www.smartyearsapps.com</a>		
<b>Talkie ToT</b> <a href="http://www.smartyearsapps.com">www.smartyearsapps.com</a>	*	<p>Smarty Ears has long been a leader in creating high quality apps for Speech-Language Pathologists. These apps cover a wide range of speech-language related areas, such as AAC, oral motor activities, articulation, language skills, verb usage, adjectives, prepositions, WH questions, disfluency, reading, auditory memory, and language concepts related to go-togethers, functions, feelings, and more. In addition to the motivating material, excellent sound and graphics, the apps have many program options such as optional text display, ability to replay audio, ability to increase difficulty with success, automatic advance, and much more. Most apps have Report Cards for each session, full data collection and easy report writing and progress monitoring. Smarty Ears has over 60 apps in English and many include options in Portuguese, Spanish, Dutch, German, Italian and French. See previous DISKoveries articles for reviews of many of these apps. There are free versions of all the apps so you can try beginning levels before you purchase.</p> <p><b>Talkie Tot</b> is designed to assist children with language delays, autism, limited verbal language and those who are beginning to learn to use visual support to communicate. Children at the one word level can benefit from the practice they are provided in hearing simple word combinations, visualizing their meaning, and then succeeding in combining the words/symbols to create two word phrases.</p> <p>There are three levels to this app, and each level has three parts and 90 phrases. The first level contains Core Phrases (i.e., go home, come here, all done, more please, help me, etc.) The second level is Talkie More and includes phrases such as big shirt, black cat, furry dog, hot stove, etc. Level 3 has action phrases, such as bake cake, kick ball, pull wagon, etc. Children hear the phrase spoken in a natural, child's voice and see a large picture setting the context and displaying the meaning of the phrase. Each symbol is color coded, and each word is spoken individually when the symbol is pressed.</p> <p>Children drag the individual displayed symbols to create the phrase, then hear it spoken aloud again. As with other Smarty Ear apps, this app is well designed with bright, clear pictures, motivating Smarty Symbols, excellent recorded voice (thanks to Victor) and a range of options. For more details, and to see pictures, video and content information, visit <a href="http://www.smartyearsapp.com">www.smartyearsapp.com</a>. The first level of Talkie ToT is available free so you can try it out and see how it works with your child. Thanks to Barbara Fernandes, ASHA certified Speech-Language Pathologist, for her outstanding skill and knowledge in designing and developing these creative apps.</p>



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 (e-mail: [ForTLL@aol.com](mailto:ForTLL@aol.com))



PRODUCER/WEBSITE	KEY	BRIEF REVIEW
<b>TactusTherapy</b> <a href="http://www.tactustherapy.com">www.tactustherapy.com</a>		
<b>TactusTherapy</b>	*A	<p><b>Tactus Therapy</b> has produced an excellent group of speech therapy apps designed to help adults with stroke recovery and useful as well for both children and adults with autism, language delays, apraxia and other speech and language disorders. The apps have been created and designed by Megan Sutton, ASHA and CAS (Speech-Language &amp; Audiology Canada) certified Speech-Language Pathologist and author/lecturer on topics related to aphasia, stroke recovery, adult rehab, and on using apps for speech therapy and home treatment.</p> <div data-bbox="651 363 1338 814" data-label="Image"> </div> <p data-bbox="574 825 1398 898">Tactus Therapy - Speech Therapy In Your Hands  <a href="https://www.youtube.com/watch?time_continue=135&amp;v=NN5YMjLT5oo">https://www.youtube.com/watch?time_continue=135&amp;v=NN5YMjLT5oo</a></p>

PRODUCER/WEBSITE	KEY	BRIEF REVIEW
<b>Advance Writing Therapy</b> <a href="http://www.tactustherapy.com">www.tactustherapy.com</a>	*A	<p>This comprehensive app is designed to continue where Writing Therapy left off. The four levels are as follows: 1-Match (Hear the sound the letter or letters make or the name of the letter and press the letters from a choice of 4. Letters are presented in groups of consonants, vowels and blends) 2- Spell (type the word you hear-contains the 300 most common words In English. Words can be set for 2-7+ letter words). 3-Type (typing to dictation one to 8 word functional sentences that can be used in emails, chats, &amp; text messages.) 4-Write (Practice writing your own sentences- and listen to what you've typed to proofread).</p> <p>Each level has individual supports to help guide the learning and options to control difficulty, cues, letter style and more. You can also record yourself, email results, and set number of trials. This is a thorough and motivating app for use both in language therapy or as a tool for home practice. Advanced Writing Therapy is also included in Tactus' collection Advanced Language Therapy 4-in-1 which also includes Advanced Comprehension, Advanced Naming, and Advanced Reading Therapy.</p> <div data-bbox="651 1333 1338 1785" data-label="Image"> </div> <p data-bbox="672 1808 1317 1881">Language Therapy vs Advanced Language Therapy apps  <a href="https://www.youtube.com/watch?v=CXb2AETExuA">https://www.youtube.com/watch?v=CXb2AETExuA</a></p>

PRODUCER/WEBSITE	KEY	BRIEF REVIEW
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**InnerVoice: Communication** / ittherapy, LLC [www.innervoiceapp.com](http://www.innervoiceapp.com)

**InnerVoice** is a unique speech-generating, language learning app for Apple tablets that uses some very special technology and applications to help individuals learn speech, language and social communication skills. These include Microsoft's Artificial Intelligence (AI) and Visual Language. When first beginning the app, users select an image that will speak for them- the avatar they choose can be their own picture, or one of the 6 faces included in the program or they can add any other they want. Pictures can be modified by selecting a voice (child, man, woman), changing the pitch, rate and degree of mouth movement. When making avatars, you can also add hair, beards, glasses, etc. When your completed avatar speaks for you, you choose facial expressions, emotions and tone of voice by selecting icons for happy, sad or angry. In addition to conversing with others, this allows users to have the option to explore language by trying different emotions, voices and expressions with their sentences and observing the differences.

For communicating, users have the option of using color-coded symbols on a grid, or text to speech with an on-screen keyboard. When using symbols, the grid can be adjusted easily to display the number and size symbols and buttons you prefer. When entering button content, you are guided to use the color-coding system, which helps organize vocabulary for easier and more efficient access. The beginning grid is pre-programmed with basics to help you get started and can be easily modified. You can also share communications with others by making videos of your avatar speaking, and then posting the video to social media or by sending it as text message.

**Chat Mode** is designed to work like Amazon's Alexa or Microsoft's Cortana to stimulate conversation. Users can practice simple conversational skills, with text to speech or voice. Touch the microphone and say Hello and the device will respond with "Hi, there". Words will also be displayed. Ask "How are you?" and it will answer "Great, enjoying this day." Enter, using the keyboard and word prediction, "Do you like ice cream?" and it will answer "Yeah I do". You can ask all kinds of questions. Chat Mode is useful for those who need practice asking and answering questions or engaging in simple conversations.


With **Visual Language** mode selected, users can use their devices to look around and observe their environment. In this mode, their screen will display their avatar on top and what their device is facing on the bottom. Just take a picture and listen to the name and description of that item spoken aloud by the avatar. The description appears also in print.


Other features include text-to-speech in English and Spanish, ability to create video-modeling narratives and social stories that can be spoken by avatars and shared, sign language support, phrase history, data collection, back up and restore, and much more. The program is easy to use and intuitive to customize. It was designed for people with Autism by Lois Jean Brady and Mathew Guggemos, both ASHA- certified Speech-Language Pathologists and Certified Autism Specialists (CAS). Inner-Voice is an amazing next step in communication. See the website for a very comprehensive collection of videos and discussions about the app, its evidence driven features, its use of artificial intelligence and visual language technologies, and its application as a multi-sensory language and learning tool.



Inner Voice AAC app  
<https://www.youtube.com/watch?v=44wIDAxwu14>



PRODUCER/WEBSITE	KEY	BRIEF REVIEW
<b>InnerVoice: Sender Remote Prompting Tool</b> <a href="http://www.innervoiceapp.com">www.innervoiceapp.com</a>	FREE	<p>This is an interface that, together with the InnerVoice Communication app, lets you do Remote Prompting, a technique to support communication.</p> <p>Prompts can be sent via Wi-Fi or Bluetooth from the prompter's device to the learner's iPad to help them communicate. It is a free accessory that works only with InnerVoice2.0. The receiving device's avatar will speak what you send. You can send any message using buttons, keyboard, or favorites (from the phrase bank) or from History. This is another exciting way to help users communicate!</p> <div data-bbox="618 352 1300 806" style="text-align: center;">  </div> <div data-bbox="526 825 1386 894" style="text-align: center;"> <p>Incredibly Affordable, Fun with Video Self Modeling and Remote Prompting.  <a href="https://www.youtube.com/watch?v=qj5oNPjjDBg">https://www.youtube.com/watch?v=qj5oNPjjDBg</a></p> </div>

PRODUCER/ WEBSITE	KEY	BRIEF REVIEW
<b>Tippy-Talk</b> <a href="http://www.tippy-talk.com">www.tippy-talk.com</a>		
<b>Tippy-Talk</b> <a href="http://www.tippy-talk.com">www.tippy-talk.com</a>	*A	<p><b>TippyTalk</b> is a subscription based app that lets the user select symbols that are then translated into personalized text messages. Photos, symbols or images are selected to represent who the user wants to call and what the message contains. Voice recordings can also be attached to the symbols to help reinforce meaning for the user. From a picture/symbol menu, select a person to send the message to, then choose a category, and then an item. The message attached is sent as a text to the selected person. For example, select the picture of a person to send to, then the food category, then a pizza. The message "Hi Daddy, Can we have pizza tonight?" (or any other attached) will be sent. The user only needs internet access to send a message. (Only the receiver of the message needs a mobile device.) Video tutorials are available on the website, along with Frequently Asked Questions. A 14-day free trial is available so that you can try the app and see how it works for you and your family. This app provides a new and unique way to encourage and support communication. It was designed and developed by Rob Laffan, Automation Engineer and Autism Dad. Visit the website for videos and related information or contact <a href="mailto:info@tippy-talk.com">info@tippy-talk.com</a> with any questions or for further details.</p> <div data-bbox="618 1360 1300 1814" style="text-align: center;">  </div> <div data-bbox="548 1833 1369 1902" style="text-align: center;"> <p>TippyTalk helps people with nonverbal difficulty communicate  <a href="https://www.youtube.com/watch?time_continue=14&amp;v=_KCxX4u7ZcM">https://www.youtube.com/watch?time_continue=14&amp;v=_KCxX4u7ZcM</a></p> </div>

PRODUCER/WEBSITE	KEY	BRIEF REVIEW
<p><b>Jabberwocky</b> <a href="http://www.swiftable.org">www.swiftable.org</a></p> <p>The two Jabberwocky Apps, the Browser and AAC, are both hands-free for use with any device that supports Face ID. They have been designed and developed by Jonathan Hoag, a software engineer, co-founder and CTO of Swiftable. As of August, 2019, they are both free, with no in-app purchases and will be updated and supported by Jabberwocky and its team.</p>		
<p><b>Jabberwocky Hands-Free Browser</b> <a href="http://www.swiftable.org">www.swiftable.org</a></p>	Free	<p><b>Jabberwocky Hands-Free</b> is a hands-free web browser. If you have any device that supports Face ID, you can use the head tracking feature to browse the web using head movement and speech. The app translates your head movement into a cursor used to click and scroll. Control the cursor by moving your head and click on buttons by blinking. Scroll the page by moving the cursor to the top or bottom of the page. Use the navigation bar by typing or speaking.</p> <p>The menu on the upper right lets you go back, reload or access other options. If you get stuck, shake your head left or right quickly (as if you are shaking no) until you see a count-down. Then stop as the device re-calibrates. Configuration options include ability to control blink sensitivity so that it ignores unintentional blinks and touch assist for elements on webpages that are hard to select. The introductory tutorial is easy to follow &amp; comprehensive.</p> <p>Browsing and typing history never leave the device, so privacy is assured. As indicated above, the app is now free from the Apple App Store, with no in-app purchases, and will be updated and supported by Jabberwocky and its team. An Android version is in development.</p>
<p><b>Jabberwocky Hands-Free AAC</b> <a href="http://www.swiftable.org">www.swiftable.org</a></p>	FREE	<p><b>Jabberwocky AAC</b> is a hands-free AAC system that is controlled using head movement. It can be used with any device that supports Face ID, such as the iPhone X series and the iPad Pro 2018 series. The app translates head movement into a cursor which is then used to click and scroll. As an AAC system, Jabberwocky works together with text to speech and word prediction. The newest version supports full phrase predictions based on your history, and an adjustable dwell time. Communicators use the face ID and head tracking capabilities to type, and a text-to-speech program with word prediction to talk. Control the cursor by moving your head, and select buttons by dwelling on them. Word predictions and most common phrases (recent, frequent &amp; favorite) are stored on top of the keyboard and accessed by clicking on them. If you get stuck, just blink three times to re-calibrate. Jabberwocky also has "word draw" to type even faster by not having to stop at each letter.</p> <p>Whereas most AAC devices are costly and require specialized hardware, Jabberwocky uses an iOS device (phone or iPad) and no extra hardware. It is switch accessible- supporting switch control with external switches or by using the whole screen as a switch. It does not require wi-fi access. Safety and privacy are not a problem, since browsing and typing history never leave the device. Like the Jabberwocky browser, Jaberwocky AAC is free on the Apple App Store, with no in-app purchases. For more information and to see a video tutorial, visit the website.</p>





Jabberwocky Browser Demo  
<https://www.youtube.com/watch?v=C23UXngNirQ>



Jabberwocky AAC Demo  
<https://www.youtube.com/watch?v=I-2L5UPp5Kg>

PRODUCER/WEBSITE	KEY	BRIEF REVIEW
<b>You Tell Me Stories</b> <a href="http://www.youtellmestories.org">www.youtellmestories.org</a>		
<b>You Tell Me Stories</b> <a href="http://www.youtellmestories.org">www.youtellmestories.org</a>	Free	<p>This not-for-profit organization, founded and developed by Lynn Rubin, Educational Consultant with extensive experience in Special Education, is committed to giving parents and caregivers the tools needed to learn to effectively read to their children during the first five years of life. The organization is accomplishing this by developing an extensive multi-lingual library of interactive digital picture and print books that parents can use for reading aloud. They are also providing resources to help parents/caretakers learn reading aloud techniques for the development of pre-literacy skills.</p> <p><b>You Tell You Me Stories</b> features WordWinks which are red, italicized words embedded right into the text to provide parents and teachers with comments, questions, vocabulary and ways to engage children and encourage them to think beyond the words in the book. Reading aloud is modeled for parents and then parents can practice with support. Children are also encouraged to retell, record &amp; share their stories, and are given the tools to do so. This is a free app and contains (as of Aug. 2019) a collection of 16 books in English &amp; Spanish.</p> <p>You Tell Me Stories also provides free printable Activity Books related to each title. These can be downloaded from the website. Some of the current stories are: The Lion and The Mouse, Harry and Lulu, Oscar Finds A Home, Oscar Goes to the Zoo, Chicken Little, Little Red Riding Hood, The Little Red Hen, The Three Bears, Alfred and the Dragon, Oscar Encuentra Un Hogar, La Gallinita Roja, and others. The website contains extensive information and resources for parents and professionals on the importance of reading aloud and related research. This is a helpful resource for support and education as well as a source of excellent story books for reading aloud to young children.</p> <div data-bbox="651 747 1338 1234" data-label="Image"> </div> <div data-bbox="703 1266 1268 1333" data-label="Text"> <p>Introducing You Tell Me Stories  <a href="https://www.youtube.com/watch?v=76pccGtXaXo">https://www.youtube.com/watch?v=76pccGtXaXo</a></p> </div>

PRODUCER/WEBSITE	BRIEF REVIEW
<b>YouCue Feelings</b> Anna Vagin, PhD <a href="http://www.socialtime.org">www.socialtime.org</a>	
<b>YouCue Feelings</b> <a href="http://www.socialtime.org">www.socialtime.org</a>	<p>This book, <b>YouCue Feelings</b>, will introduce you to a new form of storytelling-online videos (like those on YouTube) and demonstrate how they can be used to help students understand and acquire crucial elements of social relationships. The book includes summaries and titles of online videos and helps the reader understand how they can be introduced and used to help students on the Autism Spectrum, those with Social Communication Disorders and ADHD. There are also 25 additional activities that use video viewing to start discussions about personal emotional experiences. Anna Vagin, PhD/Speech Language Pathologist, has done a superior job at presenting this new and exciting concept. The book is available in hard copy and in a digital version. Visit the website to see some of the ways to use YouTube Videos for social learning. If you register your purchase, you will receive free updates which include all new lists of videos and other information about additional materials.</p> <div data-bbox="613 443 1300 894" style="text-align: center;">  </div> <div data-bbox="553 911 1357 982" style="text-align: center;"> <p>YouCue Feelings: Recommendations for Younger Children by Anna Vagin, PhD  <a href="https://www.youtube.com/watch?v=oz_768vfM70">https://www.youtube.com/watch?v=oz_768vfM70</a></p> </div>

PRODUCER/WEBSITE	BRIEF REVIEW
<b>The Active Hands Company</b> <a href="http://www.activehands.com">www.activehands.com</a>	
<b>The Active Hands Company</b> Free Newsletter <a href="http://www.activehands.com">www.activehands.com</a>	<p><b>The Active Hands Company</b> has a website that specializes in making gripping aids for those who have physical disabilities that affect hand function. Rob Smith, Director and Designer of the company, is a Mechanical Engineer with a high-level spinal cord injury and partial paralysis in all four limbs. The company has products that are appropriate for quadriplegics, those with Cerebral Palsy, stroke, limb difference, missing fingers, etc. The aids are designed so that the user can put them on independently. These aids firmly hold the hand into a gripping shape to enable the user to hold tightly onto objects such as hammers, garden tools, gym equipment, wii controllers, adaptive bike handles, musical instruments, and many more. Small Item grip aids are good for small items such as make-up brushes, personal care items, cutlery, pens, etc. Active Hand gripping aids are available in a range of sizes for small children to large-handed adults. Visit the website to view the complete collection of products. The website also has a printed guide that helps you analyze and find products that are appropriate for specific needs. Products can also be searched and viewed by disability. Some of Active Hands' new and exclusive gripping aids include: No-grip Dog lead, Pet Grooming Glove, toothpaste dispenser, steering wheel cover, one-handed leash collar connector, key turners, and so much more..</p> <div data-bbox="139 1577 786 1686" style="text-align: center;"> <p><b>Active Hands gripping aids</b>  <a href="https://www.youtube.com/watch?v=yJ68GG43xVw&amp;list=PLCA9345FD68FF6A3B">https://www.youtube.com/watch?v=yJ68GG43xVw&amp;list=PLCA9345FD68FF6A3B</a></p> </div> <div data-bbox="812 1455 1495 1906" style="text-align: center;">  </div>

PRODUCER/WEBSITE	KEY	BRIEF REVIEW
<b>Ability App</b> <a href="http://www.abilityapp.org">www.abilityapp.org</a>		
<b>Ability App</b> <a href="http://www.abilityapp.org">www.abilityapp.org</a>	Free	<p>This app is not available yet, but will hopefully be launching in 2019. It will help people with any type of disability navigate public spaces and search for specific disability friendly features and services. Individuals will be able to research the level of accessibility at public spaces in advance. The app will contain a Vision filter (i.e. Braille Menus, Maps, Service Animal Relief areas, Background Noise Levels, etc.), a Hearing Filter (background noise levels, sign language availability, staff assistance, etc.), a Mobility Filter (accessible ramps, bathrooms, hotel rooms, nearby public transportation, etc.), and a Cognitive Filter (sound, light, scent sensitivities, crowd sizes, etc.). The Ability App will be on the website and also free to download to all mobile devices, Apple &amp; Android. Ability App was begun by Alex Knoll in 2014 when he was just 9 years old. Now 14, Alex continues his work as a tech founder and international speaker with a passion for helping people with disabilities. Check the website for news and updates and how you can assist with the database of information.</p> <div data-bbox="659 495 1343 947" data-label="Image"> </div> <div data-bbox="711 968 1295 1037" data-label="Caption"> <p>Ability App Update From Alex Knoll  <a href="https://www.youtube.com/watch?v=6za3OoSQ3J0">https://www.youtube.com/watch?v=6za3OoSQ3J0</a></p> </div>

# Go Braille: an Approach to Braille Instruction

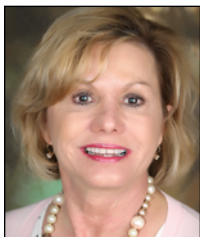
In 1829, at the age of 15, Louis Braille published a system of using combinations of six dots to represent letters and word fragments. This first uniform braille code was adopted worldwide. His invention enabled students who were blind and had low vision around the world to learn to read and write. Since that time, thousands of children and adults who are blind have become literate. Braille is to the blind what print is to the sighted. Without braille, students with blindness or low vision would not be able to spell, compose and read independently.

However, it is now well-documented in the literature that the United States and many others are experiencing a “braille literacy crisis.” In fact, in 2009, the National Federation of the Blind (NFB) Jernigan Institute noted that fewer than 10% of those who are legally blind and fewer than 40% who are functionally blind are braille readers. Also, over 70% of adults who are blind are unemployed and as many as 50% of students who are blind drop out of high school (NFB, 2009). Further, it is estimated that the lost productivity due to blindness and eye disease is about eight

billion a year in the United States. (NBP, 2010).

Recent statistics from the American Printing House for the Blind (APH, 2017) show the decline in braille instruction and materials. The Federal Quota Census for 2016 reported braille readers make up only 7.8% of students while 10.8% are auditory readers. Nonreaders and symbolic readers comprised 32.7%. Further, the Census noted that of braille pages produced, 21,174,994 were produced in 2016 while 12,838,596 were produced in 2017. Also, 93,303 braille volumes were produced in 2016 while only 61,667 were produced in 2017. However, it is understood in the field that some blind users are now accessing materials electronically (National Braille Press [NBP], 2010).

Many organizations and individuals speculate as to why braille instruction has diminished. Reasons include the shortage of teachers who are competent in braille, negative attitudes about braille among the sighted, historical emphasis of teaching print (NFB, 2009), and the increasing uses of speech generating devices (NBP, 2010).



**DR. BESTY FLENER** received her doctorate from Vanderbilt University in 1992, with a specialization in visual impairments and multiple disabilities, and is currently a low vision education specialist and assistive technology consultant for the Green River Regional Educational Cooperative. With over 30 years of experience working with visually impaired students, including serving as a regional consultant for Kentucky School for the Blind, she has presented nationally on such topics as Septo-optic Dysplasia, technology, advocacy, self-determination, keyboarding skills, the iPad for students with multiple disabilities, Response to Intervention (RtI), and literacy for students with multiple disabilities. Dr. Flener is a recipient of the National Braille Press 2015 Louis Braille Touch of Genius Prize for Innovation: Tactile Talk Toolkit-Strategies for Functional Communication and Literacy.



**JONI NYGARD, MS, CCC-SLP**, has specialized in augmentative alternative communication (AAC) and assistive technology (AT) throughout her career. She is a frequent presenter at national and international conferences with an emphasis on literacy and communication for all students. An advocate for individuals with complex communication needs across ages and abilities, Joni has authored numerous articles, books, and apps. Currently, a Vice President for Attainment Company, Verona, Wisconsin. Joni received the National Braille Press 2015 Louis Braille Touch of Genius Prize for Innovation: Tactile Talk Toolkit-Strategies for Functional Communication and Literacy.

In 2010, the National Braille Press (NBP) provided some interesting facts supporting the importance of braille instruction. The NBP noted that of the 26% of individuals who are blind and employed, the majority are braille readers. However, braille literacy rates for school-age children who are blind have declined from greater than 50% (40 years ago) to only 12% today. In a study published in 2018, Silverman and Bell investigated the correlation between braille reading, well being and employment. A total of 443 participants completed the survey. Results suggested that individuals, who were mostly primary braille readers since childhood, had greater life-satisfaction, self-esteem and job satisfaction than individuals who reported not using braille as their primary reading medium during childhood. Also, individuals who became braille readers in adolescence or adulthood had higher life-satisfaction, self-esteem and employment rates than those individuals who were not braille readers.

In addressing the braille literacy crisis, the National Federation for the Blind (NFB, 2009) made several recommendations including advancing the use of braille in current and emerging technologies and researching new methods for teaching and learning braille. The Attainment Company, in collaboration with these authors, Dr. Betsy Flener and Joni Nygard, MS CCC-SLP, is currently developing a product that encompasses a new and engaging way for students to learn braille. This product is called GoBraille.

GoBraille was developed with the idea that students should learn braille in an engaging way, one that mirrors reading instruction for typically developing sighted peers. Ideally, sighted students could sit alongside the blind student and learn the same words and word fragments in print. In the past, typical braille instruction has mostly included programming that removed the blind student from instruction with their sighted peers.

Historically, much of braille instruction has focused on learning contractions in various groups rather than the specific contractions in the sequence of sight words that students typically learn. GoBraille focuses on introducing the Unified English Braille Code (UEB) with Dolch sight words and some Fry sight words in a similar order that sighted peers learn the same words. Sight words are critical to reading instruction in that they make up 75% of words in children's printed materials (National Reading Panel, 2017). Also, sight words can build upon each other and provide clues to the context of printed material (Courtenay, 2015). Hayes (2016) noted the importance of sight words: (1) they improve a student's overall reading abilities, (2) they improve a student's confidence in reading, and (3) they are beneficial when used with other literacy instruction.

GoBraille (See figure 1) is an exciting app designed for the iPad that includes over 75 interactive tactile overlays. It is the second major commercial product to encompass tactile overlays for literacy with auditory output on the iPad. TactileTalk Toolkit, the first product by the same authors, and winner of the National Braille Press Louis Braille Touch of Genius Competition

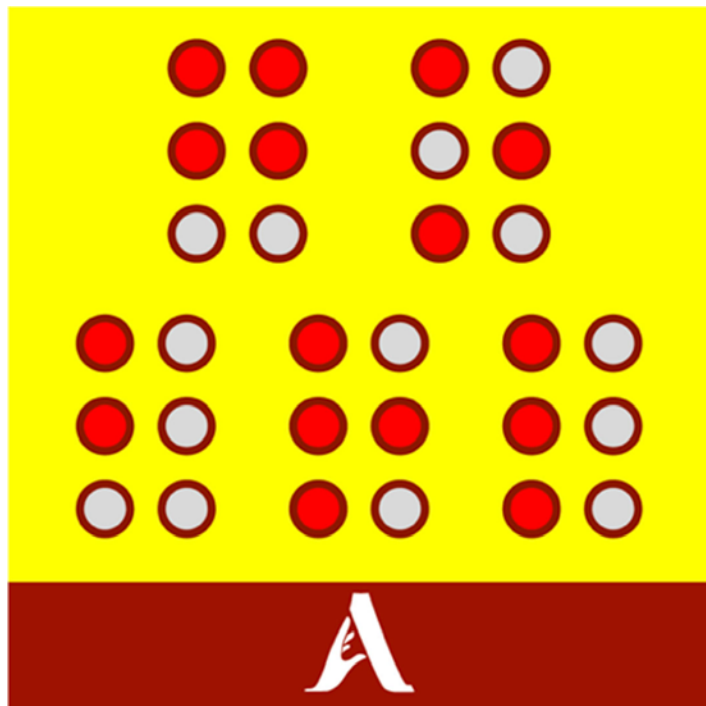


Figure 1: GoBraille App Icon



Figure 2: Page 1, Which Is Different

for Innovation in 2015, provided young learners with blindness and low vision and those with additional disabilities, a means for communication and opportunity to develop early tactile skills. The communication book within TactileTalk Toolkit incorporates tactile symbols with an easy-to-use navigation system to communicate functional needs and basic choices. The tactile skills reinforced through the TactileTalk Toolkit are precursors to braille and include skills such as texture discrimination, shape identification, size differentiation, identification of positions, counting skills and the skills needed to follow a tactile line. Also addressing early literacy, the TactileTalk Toolkit includes an



Figure 3: Page 5, Find The Letter



Figure 4: Page 9, Learn And Match Whole Word Sign

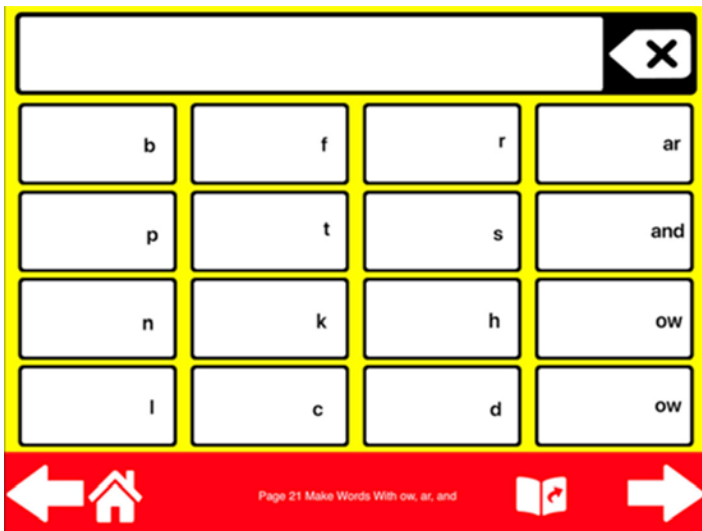


Figure 5: Make Words With ow, ar, and

adapted version of the book *Charlotte's Web* with corresponding tactile symbols and simplified professionally narrated language.

GoBraille teaches and reinforces the braille code which includes over 180 contractions. The first few pages of the app allow students to build tactile discrimination skills by finding the group of dots that form a different letter or by finding a specific braille letter in a row (See figure 2 and 3). The app then introduces a few whole word contractions and beginning primer level sight words. The practice section of the app encompasses two levels. Part 1 introduces contractions and sight words up to an approximate first to second grade level. Part 2 introduces sight words from an approximate second to third-fourth grade level. Students are engaged in matching braille words and contractions on the overlays (See figure 4), forming their own words with various contractions (See figure 5), making their own sentences with various short words (See figure 6), reading sentences or paragraphs on the overlays (See figure 7), and reading a short story, all with auditory feedback. In fact, the app and prototype overlays have been trialed by teachers of young students who use braille and the results have been positive. Students who trialed the app enjoyed the immediate auditory reinforcement.

GoBraille is designed to be used along with other reading strategies and materials. GoBraille teaches all contractions used for basic reading including some punctuation marks, allowing the program to stand alone as a program that teaches initial braille skills. Primary features that set GoBraille apart from other programs is that sighted students can sit alongside the child who is blind and also learn sight words and a paraprofessional can use the program under the supervision of a qualified teacher of the visually impaired.

GoBraille is a program that will lend itself to the next generation of braille learners. We all recognize the importance of learning concepts and literacy. In 1829, when Louis Braille created the braille code, thousands of children and adults who were blind began becoming literate. With rapidly developing technologies, there are additional strategies people can use to communicate and become literate. However, since braille is to the blind what print is to the sighted, we know that new and different ways to learn braille are critical to the development of literacy in generations to come. Without braille, students with blindness or low vision would not be able to spell, compose and read independently. We are excited for a new generation of braille learners to begin their journey to literacy with GoBraille.



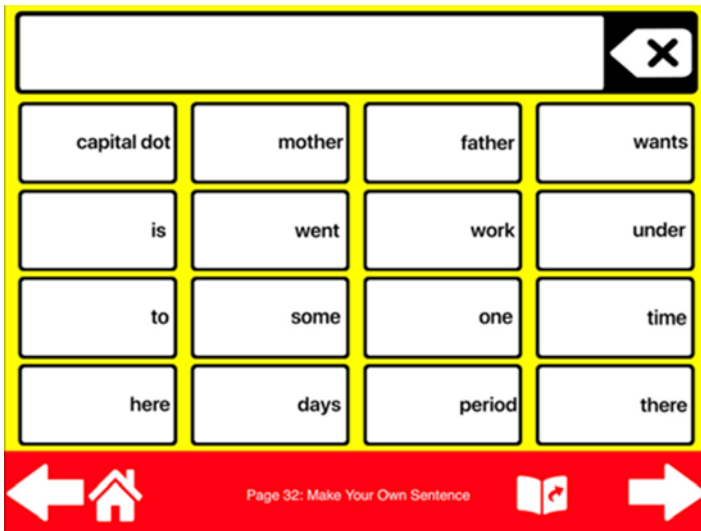


Figure 6: Page 32, Make Your Own Sentence

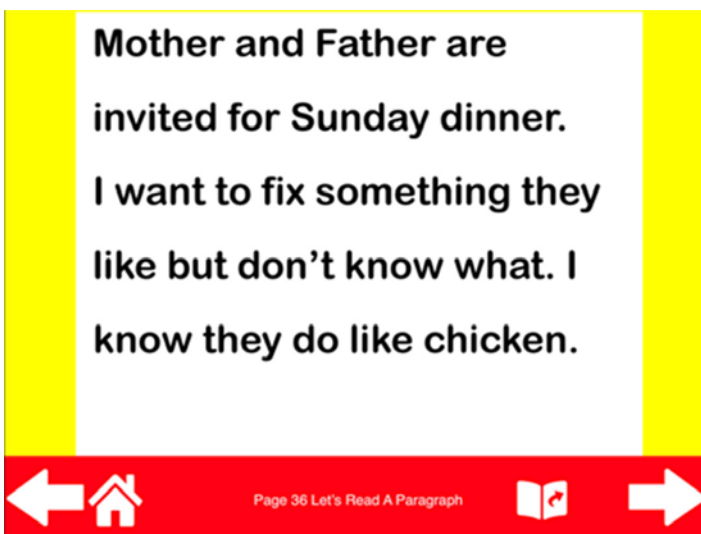


Figure 7: Page 36, Let's Read A Paragraph

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# product spotlight

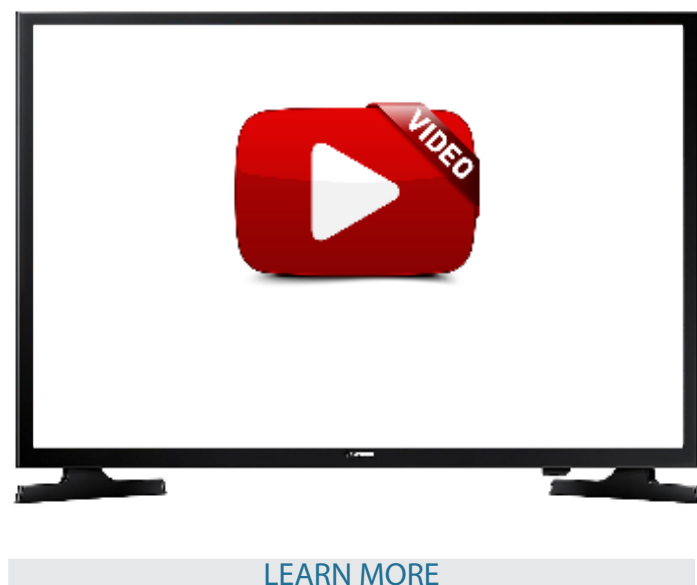
## WAYBAND – NAVIGATION THROUGH TOUCH



### WHO ARE THEY?

WearWorks is a design company that created haptic technology to deliver richer, safer, and more intuitive navigation experiences for individuals of all sights. This includes and is not limited to commuters, travelers, marathon runners, cyclists, skiers, the blind, and the visually impaired.

Their first product, Wayband™ by WearWorks, is a wrist-wearable navigation device that guides individuals to a destination using only vibration.



## American Printing House for the Blind – Code Jumper

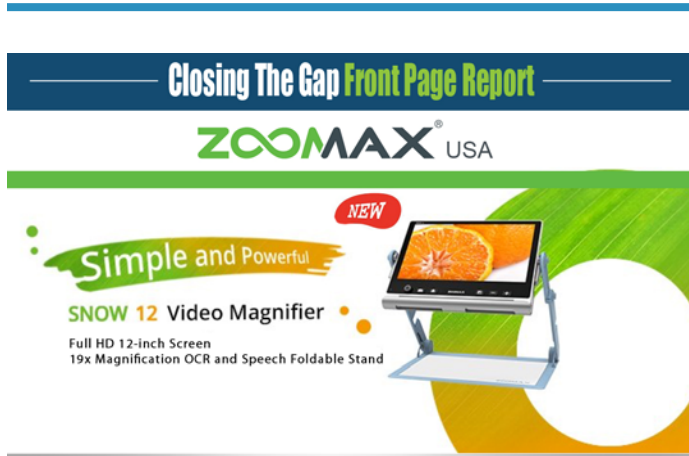


Code Jumper™ is the newest innovation to assist children, regardless of their level of vision, in learning computer coding and programming skills through a unique, physical system. Developed by Microsoft® and distributed by APH, this educational toy bridges the skills gap and opens up the world of coding to every student.

Children not only learn basic programming concepts, such as sequence, iteration, selection, and variables, but will also be encouraged to think computationally, such as solving the same challenge in multiple ways.



## Zoomax USA – Snow 12



Zoomax Snow 12 is a portable video magnifier that delivers true visual independence for people with low vision. It features a unique foldable stand that elevates Snow 12 so that you can more easily read, write, look at objects or even perform full-page scanning using the powerful OCR and text-to-speech. With standard features like a 12-inch full-HD touch screen display, magnification up to 19x, and a simple accessible interface, Snow 12 is perfect for all situations.

### THEY THOUGHT OF ALMOST EVERYTHING

They designed Snow 12 to make life easier. They added an analog stick to allow you to pan around a document without needing to move your reading material so much. The foldable stand lifts Snow 12 off the table for times when you'd prefer to place reading materials or objects like a medicine bottle or small item underneath. The stand also makes it much easier to see what you're writing.



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## AbleNet – The New TrackerPro 2 Head Mouse



The NEW TrackerPro 2 head mouse provides reliable hands-free mouse control for individuals who are unable to use a traditional computer mouse. The smooth and pixel precise cursor control of TrackerPro 2 opens a world of possibilities for the user. An individual can use communication software, browse the internet, read a digital book, type an email, or just about anything else that can be done on a computer, tablet, or phone.

### IMPROVEMENTS TO THE NEW TRACKERPRO 2 INCLUDE:

- Updated electronics and tracking camera
- Compact and modern design
- Two integrated switch jacks for left and right click
- Improved mounting hardware



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## Convo – The Evolution of Interpreting



As a Deaf-owned company, their understanding of human connection is different than most. In a rapidly-advancing world, technology is often developed on the basis of spoken language. They offer a different perspective: universal communication solutions that just feel right.

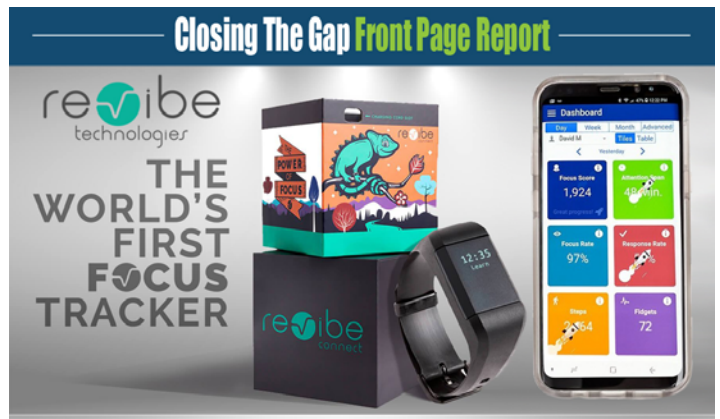
### VIDEO RELAY SERVICE INTERPRETERS THAT ARE HUMAN

The way they see it, interpreting is a job only a human can do. The video relay service industry is a perfect marriage between technology and humans. While the technology front takes care of all the black-and-white stuff that makes our service connection possible, it's the service aspect that is all about human connection. When it comes to their interpreters, they plunge into the gray.



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## Revibe Technologies – The World's First Focus Tracker



### INVENTED BY A SCHOOL PSYCHOLOGIST

After providing consultation for 1,000+ students with developmental needs, Rich wasn't satisfied with the current products on the market for kids struggling to focus.

Revibe Connect sends silent vibrations to the wrists of users to gently remind them to get back to their work, studies, etc. When users feel a vibration on their wrist, they are to simply ask themselves: "Am I doing what I'm supposed to be doing?". If on-task, they keep up the good work! If off-task, it triggers them to get back to the task at hand. The ultimate goal is to foster independence by increasing metacognition (the act of thinking about one's own thoughts).



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## Outloud – With Their Apps You Can Make Speech Therapy More Effective and Fun!



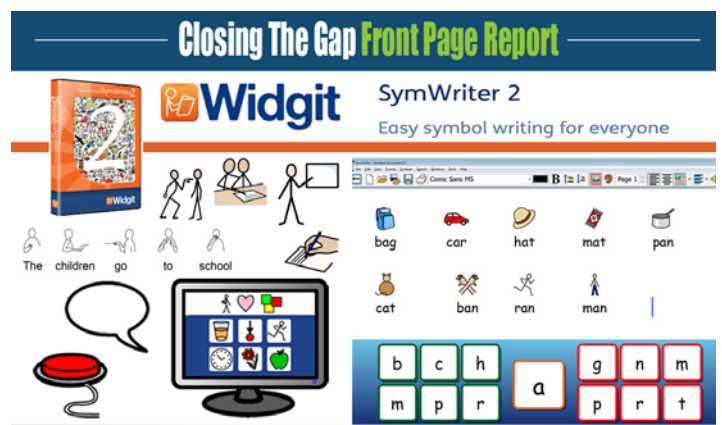
### WHO THEY ARE

Outloud is a Finnish app developer specializing in speech & hearing rehabilitation. Founded by a passionate speech therapist, they help you speak outloud!

### THEIR HISTORY

Outloud Apps was founded by an SLP specialised in working with speech- and hearing-impaired toddlers. She has developed a visual timer and voice-activated gamified apps to make the sessions with her little patients more effective and fun and make the work of other therapists easier also.

## Widgit – SymWriter 2 – Easy Symbol Writing For Everyone



SymWriter 2 is a symbol-supported word processor that any writer, regardless of literacy levels, can use to create documents.

Writers of any age or ability can use the Widgit Symbols to see the meaning of words as they type, supporting access to new or challenging vocabulary.

### WRITING

- Write with symbols or text
- Environments supports new and emergent writers
- Create your own or use pre-made environments
- Download free and low-cost environments
- Show symbol choices, even in text mode
- Adjustable text and symbol size
- Import graphics to support specific words



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**100+ Archived Webinars**  
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**Resource Directory**  
2,000 Products

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- 150+ Contact Hours
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INDIVIDUAL PREMIUM MEMBERSHIPS		
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\$ <b>440</b> annually	\$ <b>648</b> biennially	\$ <b>274</b> annually

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### Build District-Level Capacity

Support ALL educators with the training, tools and resources they need to successfully implement new and emerging technologies into existing programs, while simultaneously meeting education requirements.

NUMBER OF USERS	STANDARD MEMBERSHIPS	NUMBER OF USERS	PREMIUM MEMBERSHIPS
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10-USER GROUP	\$ <b>1,190</b> annually	10-USER GROUP	\$ <b>4,200</b> annually
25-USER GROUP	\$ <b>2,800</b> annually	25-USER GROUP	\$ <b>10,525</b> annually
35-USER GROUP	\$ <b>3,850</b> annually	35-USER GROUP	\$ <b>14,735</b> annually
50-USER GROUP	\$ <b>5,250</b> annually	50-USER GROUP	\$ <b>21,050</b> annually

## SUPPLEMENTAL COLLEGE CURRICULUM – ELECTRONIC TEXTBOOK

Solutions, as an electronic textbook, is a very effective and cost efficient state-of-the-art training tool for undergraduate and graduate university students in the disciplines of special education and rehabilitation.

1-YEAR, STANDARD STUDENT MEMBERSHIP	1-YEAR, PREMIUM STUDENT MEMBERSHIP
\$ <b>85</b> annually	\$ <b>274</b> annually

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