Assistive Technology Resources for Children and Adults with Disabilities

Closing The Gap

Solutions

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Supporting Alphabet Knowledge and Phonological Awareness for Students with Significant Disabilities Including CVI

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INTRODUCTION

This series of articles is specifically focused on the importance of providing emergent literacy instruction to student with significant disabilities including cortical vision impairments (CVI) and complex communication needs (CCN). Emergent literacy instruction is quite different from conventional literacy instruction. *Conventional* literacy instruction focuses on areas such as sight word identification, phonics, spelling and learning formal comprehension strategies. *Emergent* literacy focuses on all of the foundational skills that precede conventional literacy, such as simply learning that print carries meaning, how books work, what it means to be a writer and alphabet knowledge and sound awareness skills. Due to their vision, verbal and physical issues, students with CVI have had extremely limited experiences with reading, writing and language. Many of them clearly need rich emergent literacy comprehensive instruction. Erickson (2017) suggests that emergent literacy comprehensive instruction should include: shared reading, independent reading, independent writing, alphabet instruction and shared writing. Communication opportunities using AAC must be woven throughout each of these areas. Instruction needs to be designed in such a way that CVI does not become the gatekeeper, limiting literacy learning. This article, along with previous articles, focuses on how to provide such instruction for each one of the areas outlined by Erickson (2017) and expanded by Erickson & Koppenhaver (2020).

OVERVIEW OF CORTICAL VISION IMPAIRMENT

CVI is a neurological disorder that 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-Lantzy, 2018, 2019; Lueck & Dutton, 2015). Roman-Lantzy (2018) describes visual function through 10 CVI characteristics: color preferences, visual field preferences, need for light, need for movement, problems with visual complexity and visual novelty, problems with using vision to guide their reach, visual latency, atypical visual reflexes and problems with distance viewing. Students can be assessed for the level of impact of each characteristic using the CVI Range Assessment Tool. The 10 characteristics can be used to guide intervention and instructional adaptations. Each student will have different needs based on their characteristics. Students' abilities within and across the characteristics can be used to describe the severity of CVI. In broad terms, Roman-Lantzy (2019) refers to three different phases of severity of CVI. Phase I, Building Visual Behaviors, describes students who have little functional use of their vision and are learning to simply use their vision to look at something. Phase II, Integrating Vision and Function, describes students who are learning about what they are looking at and attaching meaning. Phase III describes students who have a great deal of vision but require specific instructional support as they are Developing Visual Curiosity. To date, this series on providing emergent literacy instruction for students with significant disabilities, including cortical visual impairment, has introduced readers to comprehensive emergent literacy instruction (Hanser, Musselwhite, & Wagner, 2019a), provided strategies for one component of comprehensive emergent literacy – predictable chart writing (Hanser, Musselwhite, & Wagner, 2019b), discussed setting the stage for augmentative communication (Wagner, Hanser, & Musselwhite, 2020) and delved more deeply into complexity issues for students with CCN and CVI (Howery & Barros, 2020).

ALPHABET KNOWLEDGE AND PHONOLOGICAL AWARENESS OVERVIEW

Alphabet knowledge and phonological awareness instruction are two components of comprehensive emergent literacy instruction (Erickson & Koppenhaver, 2020). These two areas are grouped together because they are highly connected and both are crucial to becoming conventional readers and writers. Developing alphabet knowledge supports phonological awareness and vice versa.

Alphabet Knowledge

Alphabet knowledge includes a range of understandings about the alphabet: the ability to distinguish letter shapes, name them, write them and identify the sounds they represent (Erickson & Koppenhaver, 2020, p. 34). As Sheldon & Erickson assert, 'Knowledge of the alphabet is the foundation of conventional reading and writing' (2020, p. 17).

Phonological Awareness

Phonological awareness is a multilevel skill of breaking down sounds in words into smaller units and has been described as the single best predictor of early reading performance' (Gillon, 2018). This term represents the conscious sound awareness of words in a sentence, syllables, rhymes, first letter or blends in a syllable (onsets), word families (rimes) and then of each individual sound (phonemic awareness). Erickson & Koppenhaver explain that it 'refers to the ability to identify and manipulate sounds in spoken language' (2020, p. 34).

INSTRUCTIONAL CONSIDERATIONS

Don't Let Vision Become the Gatekeeper

Vision is not a prerequisite for participation in emergent literacy activities. It is important that professionals do not limit literacy activities to only what the student is working on seeing. A wide range of emergent literacy concepts can be learned without vision. Sighted communication partners and students without visual impairments use shared referencing through visual channels. For students with CVI, interactions that foster learning and growth will need to reflect how they process information and share what they know. Individual letters (or words that have been outlined in a preferred color) can be used as single objects

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when following guidance for vision adaptations throughout the day. It is critical that all learners spend time talking about letter names, playing around with letter sounds and physically manipulating writing tools.

Teach – Don't Test

Make it real, not rote. Include interactive materials and informative feedback from knowledgeable others. Help students understand when their responses are unclear and that how they respond does affect the outcome.

Mastery is Not Needed

The concept of mastery is closely connected to constant testing and repeated trials-based instruction – neither are necessary or desirable. Emergent learners with disabilities are building skills across time, and their abilities will and should fluctuate – just as these skills fluctuate across time for learners without disabilities.

Check for Understanding

Some students with CVI will be able to directly point (using a body part or a computer that reads eye movements) to make a selection from complex arrays (such as all 26 letters of the alphabet), when provided with appropriate distance/spacing/size and visual features that make targets distinguishable. The same students may need to have items presented another way when there are more environmental distractions, or if s/he is fatigued. In this situation, the instructor can check for understanding by either asking the student to respond with their best YES or NO, or to pick an item from a list by using a signal that indicates, "That's the one!" For more information about alternate access techniques, see Hanser, Wagner, & Musselwhite (2020) and view this webinar from Project Core: Supporting Individual Access to the Universal Core Module http://www.project-core.com/supporting-individual-access-to-the-universal-core-module/.

Balance Explicit Instruction and Embedded Instruction

While teachers talk about the alphabet and sounds *embedded* in daily shared readings and writing activities, separate *explicit* instruction on the alphabet and sounds is also needed. The term explicit instruction refers to specific, organized lessons that target a particular skill. In the following sections, we will discuss explicit instructional activities, as well as ideas for embedding instruction throughout naturally occurring daily routines. We refer to the term 'immersion' to refer to activities that give students rich language experiences with supportive materials (e.g., alphabet books, poems, songs) without targeting specific alphabet knowledge or phonological awareness goals.

Provide Daily Opportunities for Reading & Writing Activities.

Alphabet instruction and phonological awareness are just two components of literacy instruction. Daily instruction must also include opportunities for students to apply their growing skills during real reading and writing activities. Keep in mind that many of these beginning learners are *emergent* readers and writers who need to have opportunities for simply exploring books and experimenting with writing. Learners with significant disabilities, including CVI, may be perceived as not being ready for books and writing because they can't visually process the text. However, professionals must push past this and provide highly interactive activities with rich auditory input supported by the appropriate visually modified materials which is available for students to look at, however, is not mandatory.

GENERAL STRATEGIES TO SUPPORT LEARNERS WITH CVI

Strategies and tools can increase success for students with CVI across literacy instruction, including instruction to build alphabet knowledge and phonological awareness. When adapting materials, it is essential to consult with your TVI. This cannot be overstated enough. The TVI can give specific recommendations for specific learners regarding text needs such as font, size, color and complexity of array. As discussed in-depth in Hanser, Wagner, & Musselwhite (2020), sample strategies include:

Use of Occluders

Occluders can reduce visual complexity by covering up extraneous pictures, symbols, letters, etc. For example, the occluder in this graphic shows how the OT calls attention to the target letter on a learner's alternative pencil by covering up competing letters.

(See Image 1: 3 Location Print Flip Chart, next page).

Use of Black Backgrounds

Visual complexity can also be minimized by presenting materials on a black surface, such as the large tri-fold board from Augmentative Resources (www.augresources.com). See Image 2.

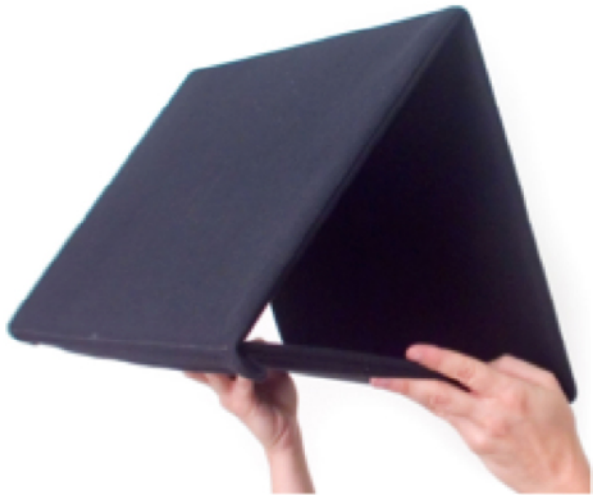

Image 2: Large Tri-Fold Board

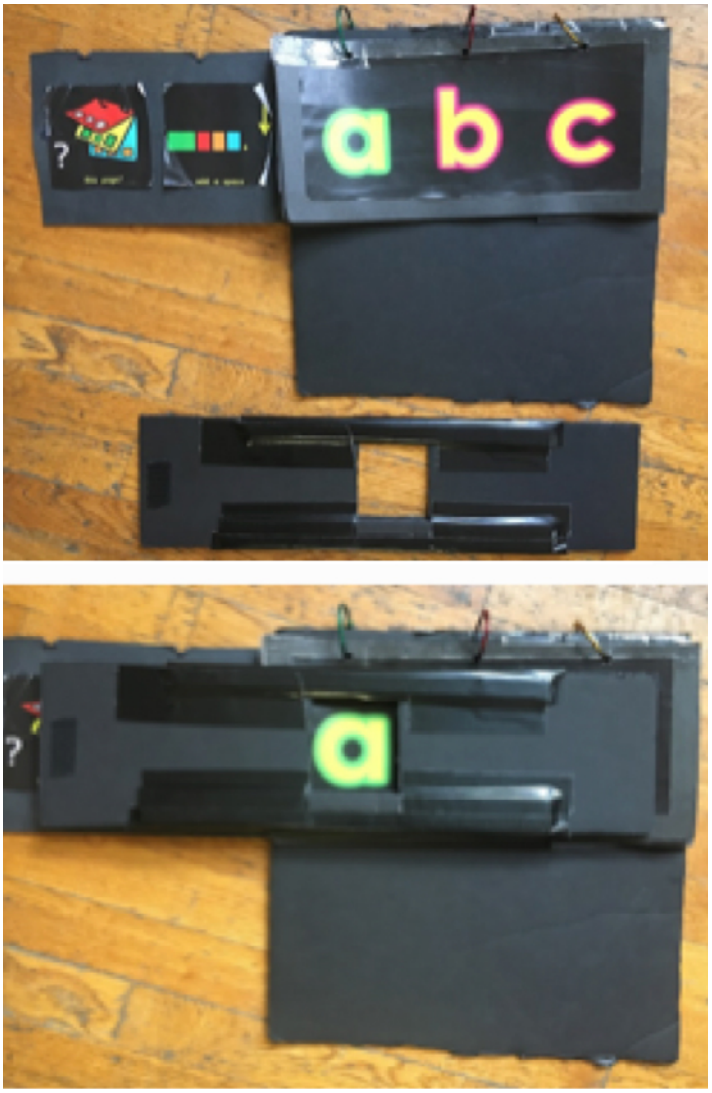

Image 1: 3 Location Print Flip Chart with Occuluder
(By Gretchen Hanser)

Use of Light

One of the CVI characteristics is defined by the need for light. Using a flashlight or a backlit screen can help focus vision on a specific area. Flashlights can be used to spotlight a target – such as a letter on an alternative pencil – and/or to add movement to gain attention.

Use of Neon Tape

Neon tape may have reflective qualities, which can draw visual attention in the same way movement does. Movement does not necessarily trigger visual processing of details, but it can help a student identify basic boundaries (such as the location of a space bar or the edges of a tablet).

Pause Time

Learners with CVI may need additional pause time for processing, especially when we are asking them to use their vision, for activities such as letter identification, due to visual latency.

Consider Background Noise

Background noise which may be filtered out by typical learners may compete for attention for individuals with CVI.

Be Aware of the Visual Battery

Individuals with visual impairment, including CVI, have a 'visual battery, meaning that they cannot use their vision for learning throughout the entire school day. Consider the visual battery when scheduling activities that require maximal visual attending (Tietjen,2019).

Offer Visual Breaks

Based on the concept of the visual battery, learners may need to take frequent visual breaks.

Use Tablets to Address Visual Distance Issues

IPads or other tablets can be extremely helpful for learners who struggle with visual distancing. Partners can take up-close pictures of materials or simply use the tablet as a viewing tool, so that teacher materials are enlarged and close up.

Help Students Develop an Inner Voice

Speaking students will verbally name letters during instruction. Students with complex communication needs who are unable to clearly articulate letter names or sounds should be reminded to 'say the letter (or sound) to yourself while I say it aloud (or out loud).'

CHECKING FOR UNDERSTANDING

For both alphabet knowledge activities and phonological awareness activities, partners will need to check for understanding. For typically developing students, many tasks (e.g., letter naming, judging rhymes or initial sounds, matching rhymes or initial sounds) rely on speech or using a movement such as placing one picture card next to another. These may be difficult or impossible for some students who have CCN, physical impairments and CVI. Hanser, Wagner, & Musselwhite (2020) have developed a chart to show how to use strategies such as multiple responses, yes/no and single message partner assisted scanning with students with significant disabilities, including CVI. Following is a brief description of the three types of student responses. Examples of each response type, concerns regarding students with CVI and helper tips for success are summarized in this article and described in more detail in Hanser, Wagner, & Musselwhite (2020). Remember that we should focus on teaching not testing. That means that checking for understanding should be intermittent, not used for every item we are presenting!

1. **Multiple Possible Responses** The partner shows several items, says the target (if appropriate for the task) and asks the student to indicate through direct selection (pointing or eye

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gaze) or partner-assisted scanning. *Concern:* This may **increase** the difficulty for students with CVI, as they must look at multiple letters, increasing the visual demands of the task. *Tips for the Helper:* Depending on the severity of the CVI, a student may have difficulty visually perceiving the differences when offered a group of items during randomized multiple choice tasks. When asked to focus on the cognitive task of naming letters, students need to have automatic recognition of the array of choices as well as the physical skill to point to the letter. Performance may be affected by the number of items an individual student can process at once, the amount of time it takes to look at all the choices, trouble seeing all items at once if they are presented outside the limitations of their visual field, and difficulties the student may have with visual novelty when a few items are selected at random. Performance data should reflect how choices of items are presented, and provide guidance as to how to group items when necessary to accommodate for vision challenges.

2. **Two Possible Responses.** The partner shows an item, then asks a question (e.g., "Is this a C?") or shows two items and asks a question (e.g., "Do these two rhyme?" or "Do these start with the same sound at the beginning?"). The student can answer with a gesture (e.g., head nod or shake, look up for yes, down for no) or through partner-assisted scanning. Some tasks might ask the student to indicate if two items are the SAME or DIFFERENT. The same approach could be used. *Tips for the Helper:* This technique depends on partners who are skilled at recognizing the learner's signals without giving additional cues or trying to assign YES/NO responses to behavior that is unclear. In addition, performance data may be unreliable based on 50% probability of getting an answer right (or wrong).
3. **Only one thing to say - "That's It!"** For this strategy, the partner gives the verbal target ("Let me know when you see the <target>"), then shows only one item at a time, placing less visual demand on the student. When the student sees the target s/he touches a symbol or uses a device to say "That's it!" *Tips for the Helper:* This strategy presumes accurate and timely device activation. Identifying the target requires thinking through the options (cognitive processing) as well as the physical task of activating the device (motor coordination and timing). If student activations of the switch are not yet automatic performance data may be affected.

ALPHABET INSTRUCTION FOR STUDENTS WITH CVI

Students with significant CVI are likely to encounter access barriers to developing alphabet knowledge, but strategies are available to support their success. While learning the alphabet can be a highly visual task, it is important to strike a balance for students with CVI between the visual demands and the need for learning through auditory channels. When the tasks are too visually taxing, learners will need auditory input in order to get access to the broader, richer literacy concepts.

Roman-Lantzy (2019) coined a technique called "word bubbling" to help students with CVI learn to quickly recognize the shape of whole words by drawing around the outside using a color that glows (https://roman-word-bubbling.appspot.com). This technique is not recommended for use during alphabet instruction, as it does not support learning the important concept that words are made up of individual letters as well as identifying the letters themselves.

The following sections address each of the goals of alphabet knowledge instruction, and suggest possible supports, followed by sample tasks for explicit instruction and embedded all-day instruction.

EXPLICIT ALPHABET INSTRUCTION: OVERCOMING ACCESS BARRIERS TO INSTRUCTION FOR STUDENTS WITH CVI

Erickson & Koppenhaver recommend an approach to explicit alphabet instruction based on the work of Jones & Reutzel (2013). This approach is also integrated into all units of the Readtopia curriculum Don Johnston Inc, Readtopia as Learning Letters (Erickson et al, 2019). This routine provides about 10 minutes of instruction per day of rapid cycling through the alphabet (one letter per day), allowing for at least seven cycles during the school year. The order of the cycle changes based on research (e.g., 1st – letters most frequent in student names; 2nd – alphabetic order). Within each cycle, the routine emphasizes: letter name ID, letter-sound ID, recognizing the letter in text, and producing the letter form (by writing or using an alternative pencil). See Erickson & Koppenhaver for a detailed explanation of this instructional routine (2020, pp. 36 – 40).

The following section discusses access barriers related to attending to letters, naming letters and identifying sounds that letters represent. We also suggest ways that students who have both CVI and CCN can 'show what they know.' Remember that assessing what students know should be ongoing, and students should not have to give responses to every item. The goal must be teaching, not testing, and partners should be writing down observations, rather than constantly checking to make sure that students are getting the 'right' answers. In addition, the errors that students make often give us important information about what they do not understand, which can help us modify our instruction. Below are suggestions for overcoming barriers and identifying possible ways in which students with CCN and CVI can show what they are learning. In general, the amount of alphabet instructional time should be brief, taking into consideration the amount of visual effort required. Alphabet instruction is one small component of daily literacy instruction and students need to have enough visual endurance for a range of literacy tasks. For example, the Learning Letters component of the Readtopia curriculum (based on Jones, et al., 2013) is only suggested to take 10-15 minutes per day.

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Distinguish Letter Shapes

With regard to letter shapes, students must be able to distinguish both lowercase and uppercase letters, as well as recognizing letter shapes in various fonts. Students with CVI, especially Phase I and Phase II, will struggle to distinguish letter shapes. Professionals need to take great care in not letting letter shapes be the only alphabet instruction provided, as students also need other alphabet activities in parallel to help them understand what letters are for, even if instruction is primarily via auditory channels. Adaptations include:

1. **Modify Size, Font, and Color:** Ultimately, students will need to recognize a range of type fonts, plus letters of various sizes and colors. For initial learning, these features can be manipulated to make letter learning as easy as possible. A functional vision assessment by the Teacher of the Visually Impaired (TVI) may give guidelines on ideal font size, color, background, font type, etc. for initial instruction, specific to individual students.
2. **Reduce the Complexity:** Even if we make letters as visually salient as possible re: size, simplicity of font, colors, etc. they may not be accessible if they are presented against a busy background (or in a busy environment). Placing a letter card on an appropriate background (often, a black non-glare surface such as a Velcro board) may increase the possibility of distinguishing the shape. For some learners, reducing complexity also involves reducing all sounds and movements in the environment (like other students talking or moving around) in order to visually focus on a single item.
3. **Consider Other CVI Characteristics:** Refer to the chart in Hanser, Wagner, and Musselwhite (2019a, p. 4) showing the literacy implications of CVI characteristics. Consider factors such as:
    - The Need for Movement: *Mini Example:* Roger observes visual stimuli best if moved from his peripheral to central vision, with occasional shaking. His teacher understands that movement helps initiate and direct his gaze, but he may not be able to see details until he engages his central visual system. Explicit instruction on the shapes of different letters must be brief, taking into consideration the amount of visual effort required.
    - Visual Latency: *Mini Example:* Alejandra needs at least 10 seconds to look at a stimulus (such as a letter). Her aide knows to wait quietly and not to give a verbal directive until Alejandra has had enough time to look at the letter first.
    - Difficulty with Distance Viewing: *Mini Example:* For Hana, the Smartboard might as well be on Mars! With everything so far away, she couldn't tell what was important to look at and could not see individual letters. When the teacher found an app to reflect the Smartboard on an iPad (e.g. Team Viewer, or simply using the iPad camera), her visual engagement grew significantly and she was able to visually attend to the same letters as the others in her class. *Mini Example:* Jamal's classroom typically had materials presented at the front of the room by the teacher. His TVI suggested making duplicate materials for his aide, Joe, to present to him, greatly increasing Jamal's visual attention. This way Jamal and Joe are able to jointly attend to a specific letter, picking it up and moving it around against an uncluttered black background.

Name Letters

Letter naming is (relatively) easy for students who are able to talk. However, as Howery & Barros point out, '. . . many children with CCN have problems with their vision' (2020, p. 42). This means that students who are already struggling to distinguish letter shapes may also need to find a way to name them other than using their voice. Remember that when reporting progress and discussing performance with the team, compounding complexities of CVI must be considered.

Mini Example: Jacob is a high school student with CVI who is nonspeaking. Jacob is able to use his hand to point. The teacher starts by naming the letter M, and asks students to say it with him. Jacob's aide Mr. Dario quietly reminds him to 'say it to yourself.' The teacher then shows three lowercase letters placed on a black background and asks Jacob to 'find the M.' When Jacob is not successful, Mr. Dario says the prompt again and uses the black background, but presents only one letter at a time, having Jacob indicate yes /no (by using head gestures) to indicate whether each one is the letter M. Then Mr. Dario shows Jacob the uppercase M and names it, asking Jacob to 'say it to yourself', but does not have him try to find it. Mr. Dario does not check for understanding each time the teacher presents a target letter, but instead quietly tells Jacob 'That's the letter S. Let's say it together. S.' as he shows Jacob the target letter, again against the black background. Mr. Dario uses both the lowercase and the uppercase version of each letter.

Write Letters

Many students with CVI have motor problems that make letter formation difficult if not impossible. Some students might be able to use keyboards, especially if they are modified by adding tactuals, removing un-needed keys (e.g., function keys, print key), enlarging letter labels, adding colors or using occluders. Many students with CVI will need 'alternative pencils' or unconventional tools that give students access to all 26 letters of the alphabet, even if they can't hold a pencil or type on a keyboard. Hanser (2020) has created a number of alternative pencils specifically designed for use by students with CVI. Students can use different approaches (eye gaze, partner assisted scanning using gestures, vocalizations & facial expressions, or partner assisted scanning using a single message device) to indicate their letter selections. These alternative pencils differ based on features such as:

- **Colors:** Both the color of letters and the color of the background should be considered, based on input from the TVI

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to enhance their visual salience for the individual student.

- **Number of Items:** Some students may have an alternative pencil with all 26 letters showing, such as an eye gaze display. Other students may have a limited letter set (e.g., 3 - 6 letters) showing at a time, in a flipbook format. Students with Phase I CVI (who are still learning to use their vision) may benefit most from a tool (high tech or light tech) that presents only one letter at a time.
- **Font Type, Effect and Size:** As with showing letters for shape identification, partners should carefully consider the type font. Letters should be presented in simple fonts such as Century Gothic. For example, Hanser (2020) provides alternative pencils with letters that have a glow highlighter around the edges of the letter (made using the Glow text option in Microsoft Word). See Image 3 and 4 below.

Image 3: 3 Location Print Flip Chart with font using Glow Text Option (By Gretchen Hanser)

Image 4: Single letter per page Print Flip Notebook, by Gretchen Hanser (Idea from Linda Burkhart)

Identify Sounds That Letters Represent

The final explicit alphabet knowledge task is to identify sounds that letters represent, such as /k/ represents the letters C and K, and /m/ represents the letter M. To check success, the adult says: "What sound does this letter represent?" as s/he shows a letter. This is a tricky task for students with a combination of CCN and CVI. For this task, students can identify words that begin with the target sound. Strategies from the 'name letters' task can be used to identify target sounds. The complexities and concerns for students with CCN and CVI that are noteworthy for the letter naming tasks will persist when applying these strategies to identifying sounds that the letters represent.

Mini Example: Lissie is a 5th grader in a classroom that is using the Readtopia Curriculum. Lissie's group is using the Learning Letters part of that curriculum. During the activity, the leader follows a script to tell students the sound that the letter represents and shows how the sound looks (on the speaker's mouth) and feels when she is making it. Lissie can't see the leader's mouth, but her aide Yvette makes the sound to show her how it is made. Students are asked to practice making the sound, and Yvette reminds Lissie to 'say it to yourself.' Then the class goes on a sound hunt. Yvette gets three objects (drink, hat and book) and quickly records 'That's it!' into a single message device and gives it to Lissie. Yvette asks Lissie 'Does this start with the /b/ sound like bat and best?' Yvette offers one item at a time and names it then waits to see if Lissie answers 'That's it.' Lissie says 'That's it' after the hat and Yvette says '/b/ hat. Is that the same? No, /b/ /h/ - those are different sounds. Let's try another.' When they get to book, Lissie says 'That's it.' Yvette waits to give her a high five, first saying, '/b/ book. Yes, book starts with the /b/ sound like bat and best.'

EMBEDDED ALPHABET INSTRUCTION: CONSIDERATIONS FOR STUDENTS WITH CVI

Musselwhite, Wagner, & Hanser (2020) share a wide range of instructional activities intended to be used throughout the day, at school, at home and in the community. Embedded alphabet instruction consists of opportunities for students to move beyond just identifying letters and sounds and forming letters or choosing them on an alternative pencil. Embedded instruction helps students learn the why of letters and sounds – that they are used for reading and for writing, and that written letters represent speech sounds. This is the basis of the 'alphabetic principle' which is essential in learning to read and write. The following section highlights a few alphabet activities that are highly appropriate for learners with CCN and CVI.

Alphabet Immersion Through Alphabet Books

Alphabet books are great for all learners, and help students build an 'ear print' for the letters of the alphabet. Musselwhite, Wagner, & Hanser (2020) suggest finding alphabet books that connect to the curriculum and to learner interests. Ideas for supporting learners with CVI:

- **Write Personally Meaningful Alphabet Books** Connecting students' personal experiences to the alphabet is an ex-

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tremely effective way to link what students know to something new.

Mini Example: Ale is making a PowerPoint personal alphabet book with his favorite people and things. The adults present choices of things they know he likes. Ale has Phase II CVI. He uses two single message devices to say "yes that one," and "no, not that." Only the target letter is highlighted to engage his vision. Reading the words is not the goal. The PowerPoint animation is highly controlled so that one item at a time moves onto the screen. Each page has a digital recording. The book is switch accessible so that he can control the speed through the book when he wants. He has the choice of looking and/or listening when he wants. Because he chose the pictures, they are things he is very familiar with; visual novelty is not so much of an issue. The images have been simplified using the "Remove Background" feature in PowerPoint. See both Images 5 and 6 below.

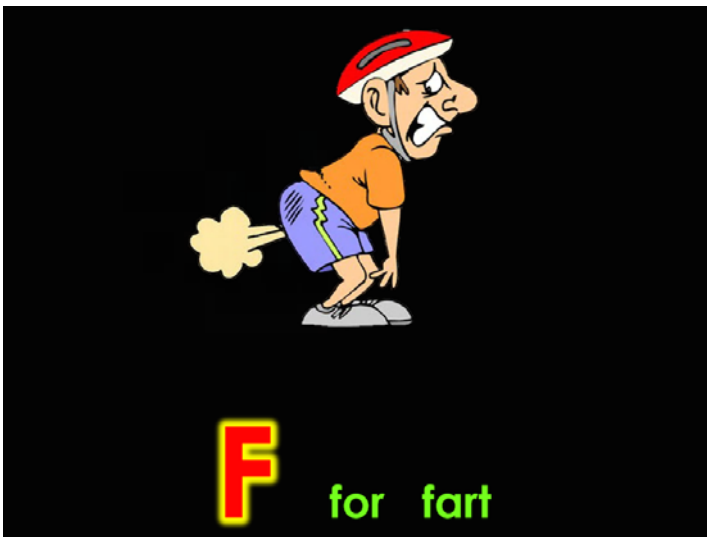
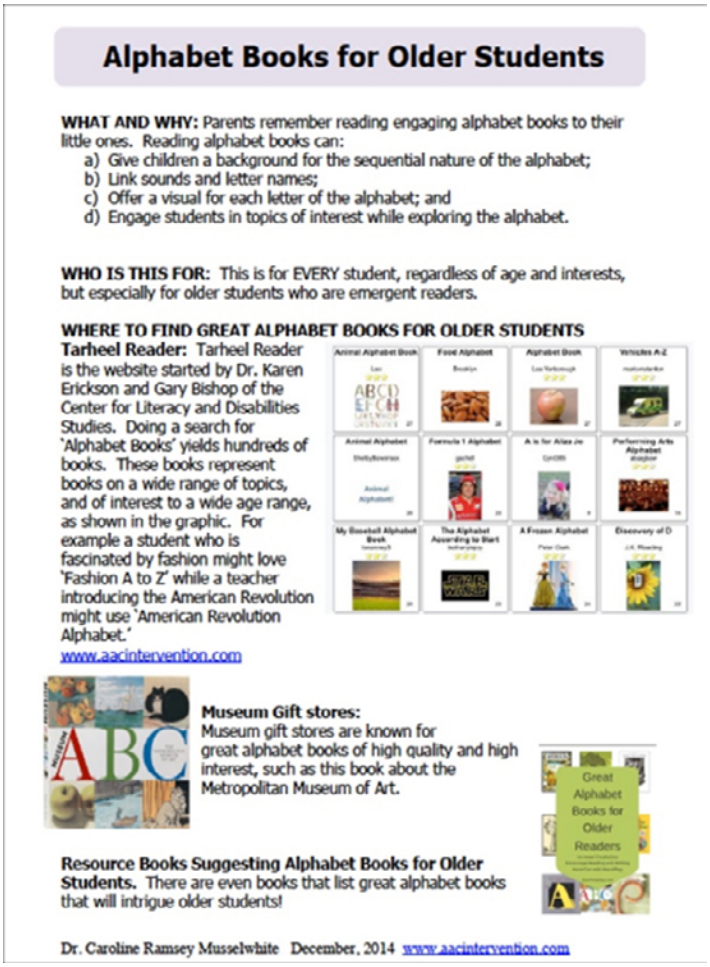


Image 5: Ale loves farts!

Image 6: Ale's favorite book is the Paperbag Princess

- **Find Alphabet Books on Tar Heel Reader.** A wealth of free accessible alphabet books can be found on Tar Heel Reader (www.tarheelreader.org). Among the thousands of easy-to-read books are hundreds of alphabet books that are appropriate for older learners (e.g., Fashion A-Z, Sports ABCs) as well as alphabet books related to the content areas (e.g., ABCs of African American History, Places A-Z). In the Tar Heel Reader Settings, the page color and text color can be changed to a black background with a choice of neon text colors. Another big bonus is that you can download your favorite Tarheel Reader books into PowerPoint. See image 7 below.



Alphabet Books for Older Students

WHAT AND WHY: Parents remember reading engaging alphabet books to their little ones. Reading alphabet books can:
a) Give children a background for the sequential nature of the alphabet;
b) Link sounds and letter names;
c) Offer a visual for each letter of the alphabet; and
d) Engage students in topics of interest while exploring the alphabet.

WHO IS THIS FOR: This is for EVERY student, regardless of age and interests, but especially for older students who are emergent readers.

WHERE TO FIND GREAT ALPHABET BOOKS FOR OLDER STUDENTS

Tarheel Reader: Tarheel Reader is the website started by Dr. Karen Erickson and Gary Bishop of the Center for Literacy and Disabilities Studies. Doing a search for 'Alphabet Books' yields hundreds of books. These books represent books on a wide range of topics, and of interest to a wide age range, as shown in the graphic. For example a student who is fascinated by fashion might love 'Fashion A to Z' while a teacher introducing the American Revolution might use 'American Revolution Alphabet.'
www.aacintervention.com

Museum Gift stores: Museum gift stores are known for great alphabet books of high quality and high interest, such as this book about the Metropolitan Museum of Art.

Resource Books Suggesting Alphabet Books for Older Students. There are even books that list great alphabet books that will intrigue older students!

Dr. Caroline Ramsey Musselwhite December, 2014 www.aacintervention.com

Image 7: Tip of the Month: Alphabet Books
December, 2014 www.aacintervention.com

- **Present Books Auditorily Only.** Books – including alphabet books – are a great option when a learner needs a 'visual break.' See Howery & Barros (2020), for further discussion of using visual breaks to re-charge a learners' visual battery.

- **Present Books in Switch-Operated Format.** Some learners will not be able to physically turn pages in a paper book and may need to use a switch to turn pages in digital

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books. Learners need the time to process letters, especially individuals with visual latency issues. Using a switch gives learners independence and the control of the timing as they page through a book. Many books can also be read online using switches, including those on Tar Heel Reader.

- **Use PowerPoint to Write/Customize Your Own Alphabet Books.** PowerPoint books can be highly adapted to meet learners' specific vision needs in regards to color, movement and sound. Page by page audio recordings can be added for times when 'listen only' is preferred (Hanser, Musselwhite, & Wagner, 2020).

Embedded Alphabet Tasks

A wide range of instructional tasks can be embedded throughout the day to build alphabet knowledge (Musselwhite, Wagner, & Hanser, 2020). Following are samples of interactive instructional tasks that can be fit into small amounts of time.

- **'Bingo' Songs or Chants.** These activities are based on the children's song, 'There was a farmer had a dog, and Bingo was his name-O. B – I – N – G – O, etc.' With each successive singing, a letter is removed and replaced with a clap. Musselwhite, Wagner, & Hanser suggest numerous variations on this, using songs or chants for student names and to introduce vocabulary for content learning (2020, pp. 30 - 36). Two strategies that they suggest to support students with CVI are:

1. **Present Bingo Chants in Light Tech Format.** Bingo chants can be as simple as having the name on a strip, with letters on Post-its. However, some adaptations will need to be made for students with CVI. In the Bingo Name Chant shown below, individual letter cards are presented on a black velcro sensitive board (from Augmentative Communication Resources). The letters are made with a simple font using the Microsoft Glow text effect. As each verse is sung, a velcro letter is removed from the board. See Image 8 below.

Image 8: Bingo Board for Amelia

2. **Increase Student Interaction and Support Vision.** Make a student version of the song board, so that it is within the optimal distance for target students. Focus should also be on features previously suggested, such as size, color, font and background to reduce clutter.
3. **Present the Song / Chant in Digital Format.** The song or chant with visuals can also be made into a video, showing the movement of pointing to letters or removing them, supporting those students who struggle with visual novelty and may need multiple repetitions before they are able to comfortably attend visually to an activity. These students may also benefit from adaptations that allow them to control the pace of repetitions (such as offering a way to start and stop). Songboards can also be modified in PowerPoint using the animation feature. This Bingo Name Chant was created in PowerPoint. At the beginning of each verse, an animation is used to make the next letter fly off the screen after which it is replaced by a blank. The student used a switch to click through the animation steps at his own pace. Verse: 'There was a boy named Gabriel and he liked to joke a lot'. See Image 9 below.

Image 9: Bingo Digital Chant for Gabriel

4. **Alphabet Action Man**. This activity takes advantage of the fun and movement of actions, connecting them to alphabet letters. Musselwhite, Wagner, & Hanser suggest strategies for modifying this activity for students with motor impairments (e.g., having them 'be the director'), and for students with CVI, such as creating an Action Man book with moving Gifs (2020, pp. 33-36). See Image 10 below.

Image 10: K is for kick gif. M is for mail gif

5. **Letter Scavenger Hunts.** Letter scavenger hunts are a very interactive way to have friends, family, and others in the environment help find pictures or objects to represent a letter. Ideally, have multiple 'teams' each searching for items with

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their letter. This should be a social activity, and students should find items that are personally meaningful. Musselwhite, Wagner, & Hanser (2020, pp. 38 - 44) suggest strategies to maximize learning through these hunts such as:

- Using Alternative Pencils. Students can use alternative pencils tailored to their CVI and motor needs to pick letters for this activity.
- Use AAC Systems to Pick Items. Partners can help students explore their light or high tech AAC systems to pick items to share with the group, and judge whether they start with the target letter.
- Make A Social Script. Partners can co-construct Social Scripts (Musselwhite & Burkhart, 2001) to support students in asking for items that represent the target letter.
- Make A Book. Partners can co-construct a book so that students have their own alphabet books to re-read, either light tech or (ideally) both light and high tech.

Alphabet Games

Students can engage in alphabet games through card games or PowerPoint games, using LessonPix or Boardmaker Online to show target letters. Students can play 'I Have / Who Has' using a voice output aid that announces their letter, and asks a peer for a different letter. Then the student must listen for her letter the next time. LessonPix is a wonderful resource that allows professionals to build a range of engaging instructional materials, including PowerPoint add-ins, such as game spinners, dice or drawing from a hat. See Image 11 below.

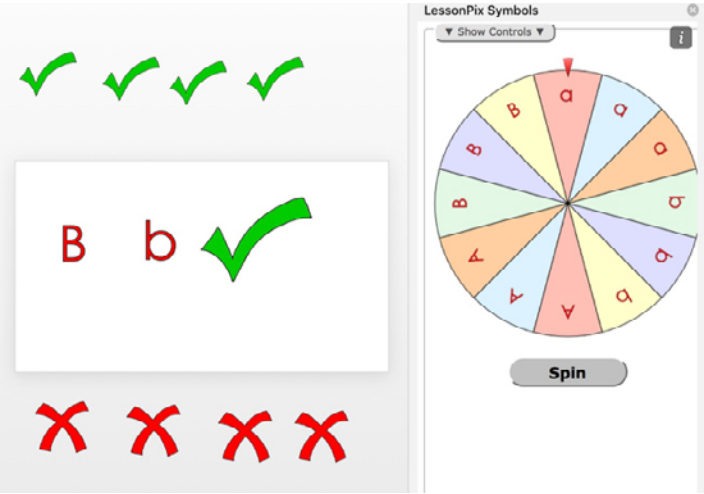

Image 11: Matching letters – uppercase & lowercase: PowerPoint + LessonPix Spinner

PHONOLOGICAL AWARENESS INSTRUCTION FOR STUDENTS WITH CVI

Phonological awareness is an auditory skill that requires students to become consciously aware of different sounds in sentences and words. Compared to alphabet instruction, phonological awareness may be easier to teach because it allows students with CVI to use their auditory strengths. This section will provide examples of embedded phonological awareness activities. If interested in information about explicit instructional programs, see: Clendon (2018), Erickson & Koppenhaver (2020), and Schuele (2008). Musselwhite, Wagner, & Hanser review key points regarding phonological awareness instruction including:

a) Phonological awareness is a metalinguistic skill, meaning that students must let us know (in some way) that they hear differences such as syllable beats in a word, words that rhyme, or words that start with the same sound.

b) Phonological awareness represents progressively smaller units, starting with dividing sentences into words, progressing to syllables, then recognizing rhymes, dividing a word into an onset (everything up to the first vowel in the syllable) and rime (vowel to the end of the syllable), then phonemes (individual sounds within a word, often referred to as phonemic awareness).

c) Levels of phonological awareness are overlapping, meaning that this is not a 'step-lock' sequence, in which students must master an earlier level before progressing to the next level (Musselwhite, Wagner, & Hanser, 2020, p. 49).

INSTRUCTIONAL CONSIDERATIONS

Pair Instruction with Print, When Possible and Appropriate to the Task

Research has found that phonological awareness instruction is more effective for some goals when paired with print. However, for some students with Phase I or II CVI, having the visual and the auditory input is too much. In addition, for some tasks, such as matching initial sounds, adding print is not desirable . Students should match pictures so that they must say the sound (out loud or in their head) for each picture, then decide if the sounds are the same.

Use of Pictures

Pictures are frequently used during phonological awareness activities to represent sounds and words. Learners who have CVI may not be able to process an image in the same way as their typical peers. This does not mean that they can't benefit from the activities, however. Carefully assess whether the images need to be adapted to highlight specific visual features, reduce clutter or verbally described. In some cases, an object can be substituted. While students may not be able to visually process the details of pictures, pictures may still be used as a visual placeholder or visual referent to aid the memory of the choices. For more information about assessing and using 2D images, see Tietjen (2018). Be sure to consult with your TVI regarding the best way to present print and pictures to your students.

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Difficulties with Generalization

Learners who are non-speaking may have more difficulty with skill generalization after phonological awareness instruction or intervention (Clendon, 2018). As Clendon noted, 'Children with disabilities have a history of receiving splintered literacy instruction that focuses on teaching skills in isolation'. She further notes that 'Children with CCN (Complex Communication Needs) often exhibit significant difficulty applying their phonological awareness to literacy tasks (Chapter 11). Thus, partners need to make those links explicit through instruction within a comprehensive literacy program. Learners must be helped to actively use the skills they are learning across reading, writing, and communication.

Increasing Complexity of Sound Units

Literature reviews (e.g., Erickson & Koppenhaver, 2020; Gillon, 2018, Sheule & Boudreau, 2008) have shown an increasing complexity of phonological awareness tasks, starting with 'shallow skills' (e.g., word awareness, syllable awareness, rhyme and alliteration) and progressing to 'deep skills' (e.g., segment initial / final sounds, blend sounds into words, segment words into sounds, delete/ manipulate phonemes). Remember that these are overlapping steps. That means that learners don't need to 'pass a test' on one step before beginning instruction with the next. The activities described here target the 'shallow skills' of word awareness, syllable awareness, the various levels of rhyme awareness, and alliteration (initial and final sounds). These are foundational skills for individuals who are emergent learners.

PHONOLOGICAL AWARENESS IMMERSION

In addition to designing tasks to target specific phonological awareness goals, students should have rich exposure to language forms that help develop an 'ear print' for features such as rhythm, rhyme and alliteration. Students should have daily opportunities to engage with phonologically rich language forms. Adults need to seek out age-respectful materials, and help learners listen and respond to them. Multiple repetitions with minor variations across the day or week can engage learners in exploring features of rhythm, rhyme, and alliteration. Several examples are provided below.

Nursery Rhymes, Songs, Poetry and Hand Claps

Reviewers and researchers have stressed for decades (e.g., Adams, 1994; Bradley, 1988) the importance of immersing young learners in forms of language that highlight features such as rhythm, rhyme and alliteration, as each of those features supports the development of phonological awareness. Musselwhite, Wagner, & Hanser (2020) summarize a wide range of activities and resources for immersing students in these language forms. Sample strategies for supporting learners with CVI are highlighted below.

Animated Step-by-Steps by Carol Goossens: Ms. Sara has introduced several poems, songs and hand claps to her class of 5 – 8 year old's, showing them on the Smartboard, with one learner using her switch to advance slides and activate animations and sounds. Eli has CVI and attends far better with movement added. His teacher sets up the computer with a switch so he can listen and look at the nursery rhymes again during independent reading time. See Image 12 below.

Image 12: Nursery Rhyme Poems

Hand Claps & Jump Rope Rhymes: Monique is a third grader with Phase II CVI. She is getting better at integrating vision and learning, but using her vision all day is fatiguing. Recess is in mid-afternoon, when she is often highly fatigued. Her occupational therapist has thought of various ways she can be engaged at recess without stressing her vision. One day each week, they use a Social Script on her TalkSuite app in story mode to help her lead her peers in jump-rope rhymes. Her peers have worked with Monique to program several hand claps that they use, such as Down In the Valley and Ice Cream Soda ('Ice cream soda/ lemonade punch/ tell me the name of my honey-bunch/ A-B-C-D . . .'). One peer helps her pick a rhyme each day to use during rope jumping, or as a hand clap. While the student described is a third grader, older students may also enjoy engaging with hand claps and jump rope rhymes.

EMBEDDED PHONOLOGICAL AWARENESS INSTRUCTION

The following section will describe instructional tasks to support students throughout the day in building phonological awareness for specific targets, such as syllable awareness or rhyme awareness.

Order of Complexity of Phonological Awareness Targets.

As described previously (e.g., Schuele & Boudreau, 2008; Gillon, 2018), there is an order of complexity of phonological

awareness, beginning with word awareness, then syllables and progressing to sound units such as onset and rime, through phonemic awareness. The following sections focus on the more 'shallow' phonological awareness targets of word awareness, syllable awareness, rhyme and alliteration.

TEACHING WORD AWARENESS

Word Awareness Overview

Word awareness is an early developing phonological awareness skill that does not require good vision. Instruction in word awareness should be brief, and should quickly lead to syllable awareness instruction. Schuele & Boudreau (2008) recommend starting first with one syllable words such as 'Ann wants a bike' because they are more obvious. Learners with CVI may also have motor impairments which make it difficult for them to 'clap each word.' Adults will need to be creative to identify ways that learners can show that they hear separate words. Learners might: stomp, blink, move head, sway, rock, or hit a tambourine with the elbow to indicate each word in a sentence. Adults and peers in a room can work together to identify the easiest way for each learner to demonstrate word awareness. Below are sample activities to support the development of word awareness.

Beat Instructions: Preschool and kindergarten teachers often have chanted instructions that they give, such as: "Line up, line up, everybody line up. Line up, line up, line up NOW!" The adults can begin representing each word with a clap, stomp, slap, etc. This activity does not require vision, but a partner can help the target student figure out a way to indicate each word.

'Beat the Words' to a Short Poem or Nursery Rhyme. For this activity, learners listen to a poem or nursery rhyme while a helper reads it and taps, claps, snaps each word. *Mini-Example:* Eliberto had a hard time showing his awareness of different words. After a few days of this activity, Randall (the aide working with him) noticed that Eliberto was making small head movements to the right. Randall gave him informative feedback: "Hey buddy, I see you moving your head. You're showing me that you hear those words. 'Peas <clap> porridge <clap> hot <clap>.' Let's do it together."

Beat the Words in a Book with Short Sentences. Evan, age 15, is crazy about rollercoasters. His Mom downloaded a book about rollercoasters from the website, Tar Heel Reader (www.tarheelreader.org). She has printed and laminated the book and sometimes shows it on the computer. They have read the book together several times. For this activity, they are not going to look at the actual book, because she wants Evan to focus on listening to the individual words. Mom tells Evan they are going to clap each word in the book. She reads the first page, clapping every word slowly. On the third page, she invites Evan to join in. He is not consistently clapping each word, but they continue to work on it. When she sees him tiring of the activity, she tells him, "You can just listen, and I'll clap the words," modeling clapping the words for the rest of the book.

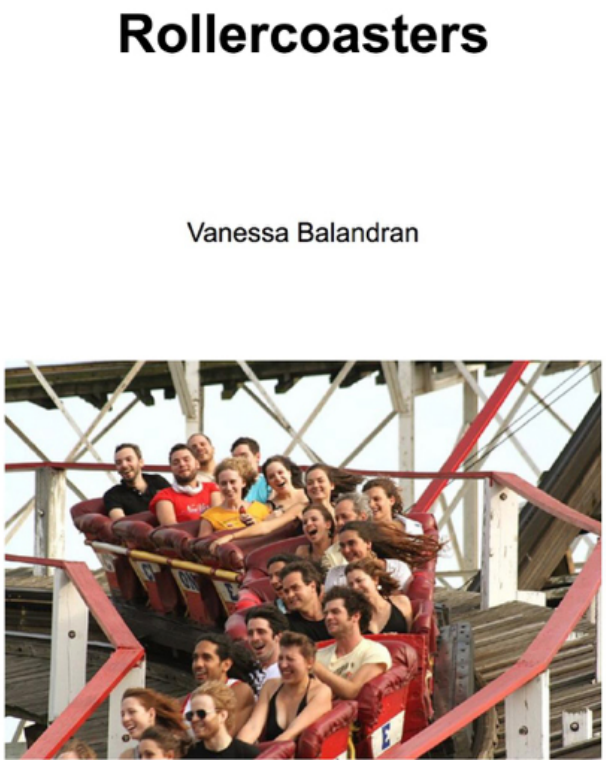

Image 13: Tar Heel Reader book

TEACHING SYLLABLE AWARENESS

Syllable Awareness Overview

Gillon (2018) explains that syllable awareness requires awareness that words can be divided into syllables. Several complex rules of syllable division underlie this process, but we can keep it simple, and just help learners learn syllable segmentation, or saying the words in drumbeats. Thus, 'cat' has one drumbeat, while 'caterpillar' has four drumbeats.

Syllable Awareness: Name Chants

Personal names are a great way to introduce many skills, including syllable awareness, because they are familiar (students hear their own name and the names of their peers throughout the day), and they are highly personally meaningful. Name songs or chants that highlight the beats in a name can be used at various points in the day, as described below.

Roll Call – I Have A Friend: 'Songboards' are the brain child of Carol Goossens. The song board 'I Have a Friend' was developed by Musselwhite (2019) to provide a visual support for a song that supports name identification and syllable awareness. The lyrics are "I have a friend and her name is Samantha, now we'll stomp her

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name. Sa-man-tha. Sa-man-tha. Sa-man-tha." This is sung for each student that is at school. The graphic shows a CVI-friendly version of the song developed by iHope School. See Image 14 below.

Image 14: Song board from Singing to Learn Songboards by Caroline Musselwhite, adapted by Gretchen Hanser

Roll Call – Name Chant: The 'Name Chant' song board (Musselwhite, 2019) provides visuals for a chant that supports name identification, letter awareness and syllable awareness. Words: 'Clap your name, tap your name, stretch it till it's long. Spell your name, tell your name. Say it like a cheer.' *Mini-Example:* High school teacher Anna M. made large blocks with student names to introduce this chant, as all of her learners have CVI. Learners first looked at the individual whose name was on the block, then were encouraged to participate in the chant by indicating the syllables in some way. See Image 15 below.

Image 15: Anna's Name Blocks

This version of the name chant has been optimized to support students with CVI. It is presented in front of a black Velcro board from www.augresources.com to reduce visual complexity by reducing the background. See Image 16.

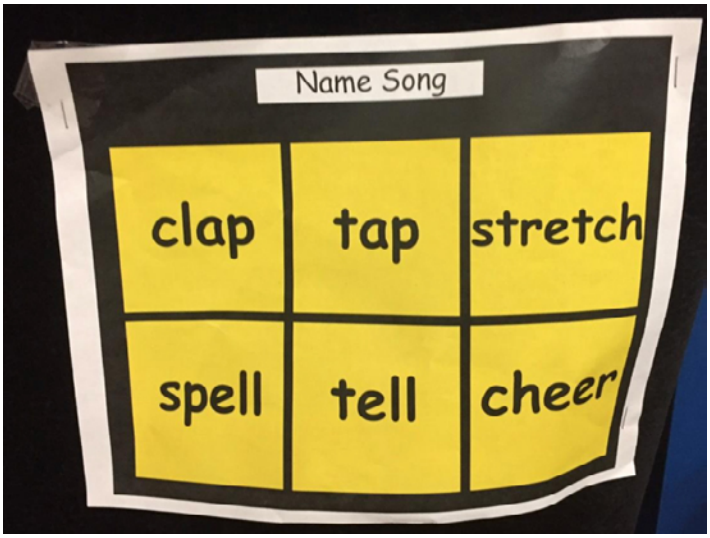

Image 16: Name Song CVI

Syllable Awareness: Compound Words. Schuele & Boudreau suggest that two-syllable compound words are good targets after segmenting sentences into one-syllable words because they are made up of words that are familiar (2008, p. 11). Start with words that your students already know, and be sure to include words with personal connections. This can be done explicitly, or just integrated into the day, as described in Musselwhite, Wagner, & Hanser (2020).

Compound Word Game. Ms. Jing introduces several two-syllable words that learners are likely to know, such as airplane, birthday, or goldfish. She starts by pretending to hold the first word 'gold' in her upended right hand, then the second word in her left hand, then claps two times as she says the compound word 'goldfish.' Other students quickly join in. Mai's helper Ms. Annabeth asks if it's okay to tap her hands and Mai indicates yes. Ms. Annabeth taps Mai's right hand as she says 'cow' and her left hand as she says 'boy', then taps both hands as she says 'cowboy.'

Syllable Awareness: Syllables in Longer Words

Once learners are showing some success with compound words, move beyond compound words, and also include multi-syllable words. Remember that learners do not need to reach mastery on a 'test' of compound words before exploring syllable awareness in longer words. Below are examples of how this learning might be extended.

Clap Syllables in a Book with Short Sentences. Mr. C used the RAPS books (Musselwhite, 1993, 2016) to highlight the beats in a story. For example, he rapped 'What should we get for the pizza to-day? How a-bout marsh-mal-lows? No way!' This was an activity that Jamal really liked, because he could rest his vision and listen for the beats. Jamal used a drumstick velcroed to his hand to tap the beats, demonstrating syllable awareness.

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TEACHING RHYME AWARENESS

Rhyme Awareness Overview

Rhyming tasks are an important component of the 'shallow' phonological awareness skills, and can be both engaging and successful for students with CVI.

Sequence of Rhyming Tasks

With regard to the order of rhyming tasks, Schuele & Boudreau (2008) suggest: judge rhymes ('can / fan' – do they rhyme?), choose one of three words that does not rhyme ('can / man / dog' – which one does not rhyme?'), match rhymes ('The car is red, the car is dead'), or generate rhymes ('everyone think of a word that rhymes with 'fun'). While the four rhyming tasks are in increasing order of difficulty, learners do NOT need to master the first task before moving on (Erickson & Koppenhaver, 2020, p. 43).

Sequence of Stimuli

The difficulty of the stimuli (the words used for rhyming tasks) is also an important factor, with suggestions given by Scheule & Boudreau (2008) and Erickson & Koppenhaver (2020):

- Visibility of the Final Rhyming Sound: The rhyme pattern 'Sam' and 'Pam' will be easier to recognize (you can see the location of the sound) than 'stick' and 'pick' (where the sound is made at the back of the mouth). Later, work towards consonants that are less visible.
- Words That End with a Consonant Rather Than A Vowel. Early rhyme activities will be easier with rhymes made with 'at' or 'ip' than 'ay' or 'oy'. The consonants at the end have clear placement cues (for /t/ the tongue is just behind the lips, while /p/ is made with the lips), but vowels don't have such a clear point of articulation.

Note that for many learners with CVI, these 'rules' for choosing words for rhyming tasks may be less important, as they may be unable to see the articulation patterns (i.e., the mouth locations where sounds are formed).

Rhyme Awareness: Judging Rhymes

Judging rhymes simply means that when presented with two words, the learner decides if they rhyme ('car / far – do they rhyme?') However, that is merely a test, and we want to provide instructional tasks that are engaging and allow us to give informative feedback to help learners figure out the rhyming patterns, not just be told if they are right or wrong. Sample strategies to support student with CVI are described below:

- Listen for Rhyming Patterns in Games: This task often includes picture cards, with students matching cards (e.g., cat / hat; sun / run) that have similar rhyming patterns (Erickson & Koppenhaver, 2020; Gillon, 2018; Yopp & Yopp, 2000). Many students with CVI will not be able to look at pictures and name the card, so a partner might need to name the card out loud. This decreases the difficulty and effectiveness of the task, as the goal is for the **learner** to say the words, then decide if they rhyme. A variation of this game is for each student to listen for a specific pattern such as 'it' and use a voice output communication aid to indicate 'that's it' when they hear words with the target pattern (e.g., sit, fit, knit, hit).
- Listen for Rhymes in Poems or Books. Miss K's class loves the funny poems at the website https://www.poetry4kids.com. She plays Mix-Up-the-Lines. Students have to decide if the lines rhyme or if they are different. For example: Zoom Gloom: 'Distance learning, what a bore. Our school's been closed a month or more. More / bore, do they rhyme?' or 'Distance learning, what a bore. Our school's been closed a month or two. More / two, do they rhyme?' Manuel and his aide use partner assisted scanning to help him figure out which words rhyme. He is not asked to look at the words.

Rhyme Awareness: Odd One Out

Odd One Out means that when presented with several words, the learner decides which one does **not** rhyme ("Which does not rhyme: it/ sit / run"). Again, this should be an interactive instructional task, not a test. Like with Judging Rhymes, adults should provide a variety of activities and stimuli. Samples are provided below:

Slap It. Mr. Jeff read about games where a monster munches the odd one out. However, he works with older students and wanted something more age-respectful. He introduced a version of 'Slap' in which picture cards are shown representing one rhyming pattern each time (ex: -at on Tuesday, -in on Thursday, -ay on Friday). Most of the cards in the pack have today's target rhyming pattern (ex: -ing), but a few cards have different rhyming patterns (ex: -am, -ip, -ay). Mr. Jeff reminds learners that they are listening for words that do not end with the pattern (i.e., -ing). Every time they see a card with a rhyming pattern that is different, they slap it (or use a device to say SLAP). Ahn has Phase II CVI and can't discriminate pictures quickly. Her partner whispers the words represented by the picture cards and Ahn decides if it is the correct pattern or a different pattern, and uses her device to say SLAP if it is different.

Rhyme Awareness: Find the Match

Find the Match simply means a learner is presented with a word, and must find the matching word. Typically, young children show this during shared reading of books (such as Dr. Seuss books) that have many rhyming opportunities. We read a line, and the learner uses the rhyming pattern to fill in the word. For learners who are nonspeaking, we may need to offer a choice of words to pick from. This may take various forms for students with CVI, as described below:

Rhymes for a Student Names. Play a sound substitution

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game, helping learners rhyme a nonsense word to their names. This activity is based on the fun Raffi song, 'Willaby Wallaby Woo', with lyrics that start out with pronouns then continue to rhyme with children's names. This is a great quick activity to share as a song or rap, rhyming with learner names for roll call, line up, or dismissal. Musselwhite, Wagner, & Hanser (2020) suggest many variations on this game. An example of a 'rap' version is: Tired Tiger Tanna, the tiger tickled Janna. Learners with CVI can participate by looking at the person whose name rhymes with the chant. It is important that all learners are situated so that they can see everyone in the game. If that is not possible, partner assisted scanning can be used, saying 'Tanna – Eric? Marcus? Janna?' then going through the names one by one.

Rhymes for a Book. Pick a fun book that your learners have enjoyed, then add some rhymes to it. For example, Ms. Judy was reading 'Cash for Trash' from the RAPS set (Musselwhite, 2016). She used the 'mind reader' activity to ask her learners to figure out which word rhymed. Examples were: Jordan says, 'I've got to dash, Off to the ballfield to pick up _____ (junk / cans / trash).' Sid says, 'See you later, fans, I'm off to the ballfield to pick up _____ (junk / cans / trash)'. Manuel and his aide use partner assisted scanning to help him figure out which of the three words rhyme. He does not need to look at the words, as the focus should be on listening for rhymes..

Rhyme Awareness: Create Rhymes

Learners generate a rhyme to go with a target word ("Tell me a word that rhymes with dog"). This activity will be the hardest for learners who use AAC because they must first think of a rhyming word, then figure out if and where the word is stored on their AAC system. Below is one idea for supporting students with this task.

Hand Clap Group Game. This activity is related to the previous hand clap / jump rope game except that the student starts the rhyme, and peers fill it in. For example, Monique, a third Grader with Phase II CVI, enjoyed using her TalkSuite app to share hand claps with her peers. After a couple of weeks of this awareness-building, her speech language pathologist added new chants where the peers would fill in rhyming words, such as 'Cinderella dressed in red, went upstairs to kiss her _____.' Peers had a great time coming up with silly rhymes such as: bed, Ted, Fred, Ned, bread, and head. They occasionally played 'Odd Rhyme Out' by adding a word that didn't rhyme and seeing if Monique caught it.

TEACHING ALLITERATION AWARENESS

Alliteration Awareness Overview

Alliteration is the basis of tongue twisters, and focuses on developing an awareness of initial sounds in a word. Learners with CVI may show success on this task because it does not depend on seeing the initial letter, but rather hearing the initial sound within a word.

- **Task Sequence.** As with rhyming, there is a sequence of difficulty of tasks. Scheule & Boudreau (2008) suggest the following in order of difficulty: Judge Initial Sounds ('Do sun and car start with the same sound?'; Odd One Out ('Which one does not have the same sound at the beginning: cat, kid, bone, car?'); Match Initial Sounds ('Which one begins with the same sound as sing?'; and Initial Sound Sorts ('Which one starts like fat and which one starts like sun?')

- **Instructional Stimuli Sequence:** Researchers have also found a sequence of difficulty related to individual phonemes or stimuli. Scheule & Boudreau (2008) suggest targeting continuing sounds (those sounds that can be drawn out slowly, such as /m/, /f/, and /r/) before stop sounds (those that stop abruptly, including /p/, /b/, /t/, /d/, /k/, and /g/). Erickson & Koppenhaver also suggest saving 'tricky sounds' (e.g., /q/, /h/, /w/) until learners are progressing well with the first two groups. As with rhymes, however, this is not a mastery approach. Once learners are making progress, it's fine to introduce the next set of sounds. This is a great task to help learners – especially those who are nonspeaking – develop their inner voice by reminding them to 'say it to yourself.' Developing an inner voice will support learners in making sound-letter connections.

Alliteration Awareness: Judge Initial Sounds

Judging initial sounds means that the learner lets us know if two words start with the same sound ("Do bat and can start with the same sound?"). As with rhyming activities this, should be integrated into an interactive task, not presented in test format. A sample instructional task for students with CVI is described below.

Are They The Same? This is played the same as games for judging rhymes. Family members or classmates can each have a picture card, with some the same initial sound (e.g., tiger / top) and some different (e.g., tiger / dog). They can pair up and figure out who has cards that are the same. Learners with CVI may need to be told the words that the cards represent, meaning that they will not form their own internal version of the word to compare with other words. If a learner cannot visually identify a card, s/he should be helped to activate the inner voice, by being told to 'say it to yourself: tiger'.

Alliteration Awareness: Odd Sound Out

Odd Sound Out means that the learner lets us know which word starts with an initial sound that is different. The task would be: 'Which of these does not have the same sound at the beginning: fan, fit, sand.' A sample instructional task for students with CVI is described below.

Spin the Words. SLP Ms. Yolanda is working with a group that are beginning to learn this task, so she is focusing on continuant sounds (sounds you can draw out like /m/ and /n). Today, Ms.

Yolanda has 'stacked the deck' with about 80% cards that start with /m/ words. Each learner draws a card, and they see who has the 'odd sound out.' That person gets to hit a voice output device that calls out 'wah wah wah.' Ramona uses an All-Turn-It Spinner from Ablenet Inc to 'draw' her card. Ms. Yolanda gives feedback to learners to help them figure it out without providing too much help.

Alliteration Awareness: Match Initial Sounds

Match Initial Sounds means that the learner tells us which word starts with the same sound as a target sound ("Which one begins with the same sound as mat?"). Sample instructional tasks for students with CVI are described below.

Find Your Animal. This is a fun activity that SLP Roberta does with groups that are working on matching initial sounds. Learners are told that they are going to find the matching animal, and to listen for an animal with the same initial sound: "Which animal begins with the same sound as Carmen?" Roberta calls out a few animals, and Carmen uses her device to tell her 'That's the one.' Carmen selects 'horse' and Roberta gives her informative feedback: "Listen: Carmen / horse, horse / Carmen. Do they sound the same at the beginning?" If Carmen says yes, Roberta repeats the pairing, then says "Carmen starts with the /k/ sound. Let's listen for /k/ at the beginning of horse, /k/ - horse. I don't hear the /k/ sound. Let's try another."

Alliteration Awareness: Initial Sound Sorts

The task for Initial Sound Sorts is to figure out 'Which one starts like run and which one starts like kite?' An instructional task for students with CVI is described below.

Name Sorts: Pick names of two learners in the class and set up an initial sound sort activity. For example, the first time she did this, Ms. Brenda picked the names Molly and Supna, because each name starts with a continuing sound (a sound that can be drawn out) and she knew those would be easier for her students. She made a chart with Molly / Supna. Then she put cards in the hat picturing words that started with the /m/ or /s/ sound. She pulled cards out and asked learners to tell her where to put each one. Rajit is a 12 year old with Phase III CVI. He is sometimes able to quickly recognize pictures (e.g., cat, milk, sun), so his aide encourages him to try the activity first without having her name the word out loud. She does remind him to 'say it to yourself' before asking him where to put the card. Staff gives Rajit informative feedback whether he is right or wrong in where to place the card. If he is wrong, they first make sure that he knows what the picture represents (e.g., 'milk' rather than 'box'). If he knows the name of the picture, but still places it with the wrong word (e.g., puts 'milk' under that name 'Supna'), they give him informative feedback about the initial sound in each word.

SUMMARY

Students with complex communication needs including CVI, face significant challenges when it comes to meaningful literacy learning. When designing instruction, professionals must recognize the role of emergent literacy in providing a necessary foundation. Comprehensive emergent literacy instruction is made up of many different components, including shared reading, independent reading, predictable chart writing, independent writing, alphabet knowledge and phonological awareness, each strongly supported by the use of AAC for students with complex communication needs. Historically, the areas of alphabet knowledge and phonological awareness have been treated more mechanically and have been taught through a rote trials format, disconnected from the other crucial concepts of emergent literacy, such as the purpose of letters and sounds, what they mean and how they are used in reading and writing. However, viewed from an emergent literacy perspective, literacy instruction should be done in a highly interactive and social format where these concepts can be taught through different activities. Alphabet and phonological awareness can be taught using a balance between short, focused, explicit lessons, and instruction that is embedded in daily activities, such as shared reading. There also needs to be a balance between when students use their vision for learning and when learning can be auditory and tactile; it is important that vision doesn't become a gatekeeper to higher level literacy concepts. Ultimately, alphabet knowledge and phonological awareness are necessary foundational skills. However, they have little value unless students are given regular opportunities to apply what they have learned during daily emergent reading and writing activities. To make all of this come together, professionals will need a basic set of student tools: letter cards with appropriate visual adaptations, a method for the student to access alphabet books, an alternative pencil with the appropriate visual adaptations, and a way to communicate. Now, pick an activity and it's time to clap, rap, dance and sing!

RESOURCES / CREATIVITY TOOLS:

Alternative Pencils - Alternative pencil downloads:

- The Center for Literacy and Disability Studies — https://www.med.unc.edu/ahs/clds/alternative-pencils/

Dynamic Learning Maps - https://www.dlmpd.com/writing-resources/

AAC Intervention: www.aacintervention.com

- ABC Order Direct Select (Tip 1, 2017)
- QWERTY Order Direct Select (Tip 2, 2017)
- How To Use Alternative Pencils (July, 2014)

Light Tech Tools

All-Turn-It Spinner available from https://www.ablenetinc.com/all-turn-it-spinner

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Augmentative Resources - www.augresources.com

materials including velcro dice, sentence flip frames, choice boards, core + fringe carriers.

Song Boards - order from www.aacintervention.com

Game Boards and Playing Cards - create with www.lessonpix.com or www.boardmakeronline.com

Recommended Webinars:

ASF Communication Training Series - https://www.angelman.org/resources-education/communication-training-series/

- #8. Actions + Four Core Set 2 with Erin Sheldon, Caroline Musselwhite and Mary-Louise Bertram.
- (Handout: Tongue Twisters D & M)
- #31. Reading: Letter ID, alphabet knowledge and first sight words with Erin Sheldon and Caroline Musselwhite
- # 42. Video Feedback with Caroline Musselwhite

Dynamic Learning Maps Professional Development:
https://www.dlmpd.com/all-modules-organized-by-claim/

ELA Claim - Students can produce writing for a range of purposes and audiences

- Emergent Writing
- Writing with Alternate Pencils

Professional Development Resources for Edmonton Regional Learning Consortium

#22 - CVI and CCN: What's the Complexity? - recorded webinar by Kathy Howery & Maren Barros https://arpdcresources.ca/consortia/complex-communication-needs-ccn/?index=22

Project Core (Center for Literacy and Disability Studies)

- Alphabet Knowledge & Phonological Awareness Module http://www.project-core.com/alphabet-knowledge-and-phonological-awareness-module/
- Supporting Individual Access to the Universal Core Module http://www.project-core.com/supporting-individual-access-to-the-universal-core-module/

What's the Complexity? Designing a school day for a child with CVI - by Matt Tietjen (includes review of CVI Characteristics as described by Dr. Roman-Lantzy)

https://www.perkinselearning.org/videos/webinar/whats-complexity-webinar-matt-tietjen

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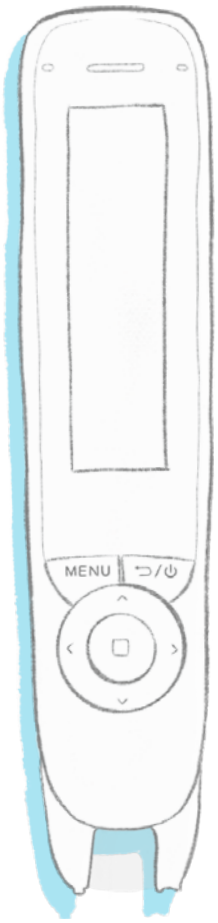

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CapAACity Building is Where it's AT! Increasing Family, School Team, and Administrative AAC/AT Involvement

By Jeanna Antrim and Maggie Judson
Thursday, August 13, 2020
3:30 pm – 5:00 pm (Central Daylight Time)

If you have been to a conference, read a research article or looked at a blog post recently, you know about the benefits of capacity building for AAC/AT. CapAACity building is where it's AT, right!? But, trying to implement it can be hard. We have all experienced the difficulty with supporting AAC/AT use with our school teams. It is even more difficult when you add in how best to support administration and families.

Join us for a discussion and demonstration of how we are implementing a 3-year approach to build AAC/AT capacity with school teams, administration, and families. We will share what is working for us based on feedback from cooperative members, changes from pre/post-survey growth, and our own observation of capacity and participation building.

Learning Outcomes:

1. Participants will be able to analyze their current model around AAC/AT support and identify one idea of a capacity building strategy to implement in their school setting
2. Participants will discuss three ways to build capacity around AAC/AT for school teams
3. Participants will be able to identify one resource to help guide an AAC/AT capacity building plan

Active Learning: The Effect of Movement, Music and Rhythm on Student Achievement

By Bridgette Nicholson
Thursday, September 3, 2020
3:30 pm – 5:30 pm (Central Daylight Time)

When we combine music and rhythm together with highly structured movement patterns, we can have a powerful impact on children's brain and body function.

In this era of remote learning, our children are spending more time than ever in front of screens and digital devices. In this webinar, we will investigate the powerful effect of structured movement and music on many aspects of child development and learning. We will incorporate technology as children can learn simple ways of making their own music and creatively developing their own movements and exercises.

Learn how you and your students can add fun and motivating movement programs to their day to have a specific and measurable impact on their learning and overall achievement. A motivating and fun "Movement, Music, and Rhythm" program that students can use immediately will be provided.

Learning Outcomes:

1. Participants will be able to explain the importance of movement and music within a global approach towards child development and learning
2. Participants will be able to discuss research that demonstrates the effect of structured movement, music, and rhythm on brain development and learning.
3. Participants will be able to set up a structured training program for their students and measure the effects of the program on student learning and

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AACcelerating Telehealth Potential: Transformation of a High-Frequency AAC Program for Children with Complex Communication Needs to a Virtual Platform in Response to the COVID-19 Crisis

Telehealth in the fields of speech language pathology (SLP) and occupational therapy (OT) have been documented to yield equivalent clinical outcomes across practice settings and populations (AOTA, 2018; Baker & Jacobs, 2012; Reifenberg, et. al., 2017). Over the past ten years, telepractice has evolved with technology advances, and has gained more traction as growing evidence demonstrates that it is a viable, effective service delivery model for SLP and OT services (Hinton, Sheffield, Sanders, & Sofronoff, 2017; Levy et al., 2018). The COVID-19 pandemic resulted in an accelerated conversion to telehealth nationwide across therapy disciplines and settings. Providers have worked throughout this time to adjust their delivery models to follow local, state, and federal agency safety recommendations, while still providing necessary therapy services with best practice in mind. In March 2020, our interdisciplinary team worked to transform the structure of our high-frequency augmentative alternative communication (AAC) program, AACcelerate, as part of our company's global shift to telehealth. Throughout this process, we encountered many barriers to implementation, but were also able to identify new opportunities as a result of this program detour. This unexpected challenge to service provision has resulted in many exciting program evolutions and the addition of permanent program components.

ANNABETH KNIGHT, OTD, OTR/L, is an occupational therapist at CI Pediatric Therapy Centers and the Director of Programming. She earned a Master's degree in Occupational Therapy from the University of Scranton, and her clinical doctorate in Occupational Therapy from Mount Mary University. Annabeth's role at CI Pediatric Therapy Centers includes program development, continuous quality improvement, and data analysis of clinical outcomes and parent satisfaction. She developed the AACcelerate high-frequency AAC evaluation and intervention program in 2017. Annabeth has had training in customized wheelchair seating, neurodevelopmental treatment, Cortical Visual Impairment, Every Move Counts, PODD, and sensory-behavioral approaches to therapy. She has presented at state, national, and international conferences about OT's role in creating customized alternative augmentative communication systems, program development, therapist training programs, the importance of family-centered transdisciplinary therapy.

MARA JONET, MA, CCC-SLP, is a speech language pathologist at CI Pediatric Therapy Centers in Madison, WI. She received her Master's degree from the University of Massachusetts- Amherst. Her clinical interests include children with complex communication needs, including those who use augmentative and alternative communication (AAC), and pediatric feeding. Mara collaborated to develop the AACcelerate high-frequency AAC evaluation and intervention program in 2017. She is passionate about using family and child centered care and working collaboratively with an interdisciplinary team. Mara has experience in multiple settings including inpatient and outpatient pediatric settings, and schools. She is trained in the Get Permission Approach to Sensory Mealtime Challenges and Pragmatic Organization Dynamic Display (PODD). She has presented at national and international conferences on the topic of customized alternative augmentative communication, program development, and therapist training programs.

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The AACcelerate Program at CI Pediatric Therapy Centers in Madison, Wisconsin is a high-frequency speech language and occupational therapy program designed to provide extensive evaluation, featuring matching, and AAC immersion to clients with complex communication and access needs

TELEHEALTH & TELE-AAC

As telehealth has grown in popularity and utilization in the fields of SLP and OT, there is growing evidence about both its efficacy and barriers to implementation across settings. The American Speech and Hearing Association (ASHA) and the American Occupational Therapy Association (AOTA), which govern practice for SLP and OT practitioners, state that practitioners can use the telehealth platform to provide evaluation, consultation, and intervention within their scope of practice, (AOTA, 2018; ASHA, 2020). Research across both professions has demonstrated that as long as telehealth services are performed with clinical reasoning and consideration of ethics similar to those used in in-person care, treatment is just as effective over the telehealth platform, (Baker & Jacobs, 2012; Hwang et al., 2016; Worboys et al., 2017). Research also indicates that unique benefits of the telehealth model include improved access to healthcare specialists and specialty programs, and increased interprofessional collaboration and information sharing through remote consultation and training, (Cason, 2012). The utilization of telehealth has also resulted in improved access to care, removing many geographic, socioeconomic, and medical fragility barriers by allowing intervention to happen in the client's own home, (Gardner, Bundy, & Dew, 2016; Hinton, Sheffield, Sanders, & Sofronoff, 2017; Levy et al., 2018). In the area of AAC intervention for SLPs, telehealth began with pioneers in the field introducing tele-AAC and establishing its efficacy. Tele-AAC allowed services to be expanded to individuals located in more rural areas. For OT practitioners, teleconsultation was frequently used in the early years of its implementation in the area of assistive technology (AT), and continues to be a frequent use of this platform today for AT evaluation and adjustment in areas such as prosthetics, seating and positioning, and home safety and accessibility, (Schein, et al., 2008; Whelan & Wagner, 2011).

In order to provide high-quality AAC and AT services over the telehealth platform, the therapist must develop competence in the specialized areas of AAC and AT, as well as telehealth. In the areas of AAC and AT, this includes the knowledge of and ability to use and troubleshoot a variety of low- to high-tech devices and equipment. When therapy is occurring on a virtual platform, additional planning is required to train treating therapists and establish confidence with the use of the AT equipment, the telehealth platform, and the interfacing of these two technologies. During synchronous (real time) services, it is necessary to make accommodations for the clinicians to see both the child and device/equipment on the telehealth platform. Practitioners may have intervention activities shared on the screen from their computer, but need to demonstrate quick troubleshooting of technology interfacing in order to navigate switching between screen shares, or multi-tasking by sharing both the virtual activity and modeled communication system through a split screen function. In addition, tele-AAC typically requires an e-helper, in order to best support an individual with complex communication needs. This caregiver assists with interventions such as equipment setup, ensuring access to technology, and facilitating continuous adjustment of the equipment and modeling language through coaching from the therapist.

When considering therapeutic intervention in the area of AAC and AT over the telehealth platform, the therapist training needs are magnified. To provide best practice in these niche areas you must consider the importance of therapist training, observation,

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and mentorship opportunities to build competency. In order to provide effective AAC and AT evaluation and intervention, and services via telehealth, practitioners require more specialized knowledge, training, and skill sets to develop competency in these specialized areas. Prior to COVID-19, our company had developed training programs for each of these specialized areas of practice. In 2018, the authors of this paper completed an internal research project (presented at the Closing the Gap Conference), which identified that skill set and competency in AAC and AT intervention was one of the biggest barriers to provision of high quality of services by generalist practitioners. We then began to develop an AAC and AT therapist training program to improve these competencies and prepare generalists for evaluation and treatment in our specialty program. Similarly, a training series for telehealth including training modules for the Zoom platform and a tiered mentorship program, was created for internal use at our facility for practitioners using telehealth as a service delivery model.

COVID-19 PANDEMIC: OUR INITIAL RESPONSE

In response to the COVID-19 pandemic, our outpatient pediatric clinic converted services across eight clinic locations to the telehealth platform over a period of two weeks. This detour involved quick formulation and implementation of action plans to convert all traditional 1:1 services in the disciplines of SLP, OT, physical therapy (PT), and recreation therapy while maintaining high-quality care. Additionally, we collaborated to establish alternative service provision options for clients currently participating in aquatics, group therapy, and intensive and/or high-frequency models of therapy. This included the transformation of our high-frequency speech language and occupational therapy AAC program, AACcelerate to the virtual platform.

AACcelerate was initially developed in 2017 by an SLP and OT team in response to the growing need for high-frequency AAC services in order to best serve clients with complex communication needs in our community. This evidence-based, 4-week program involves extended evaluation and intervention by a team of SLPs and OTs, using their combined knowledge and skills to ensure holistic intervention for AAC users. In the traditional clinic setting, the program runs 4 days a week, for 3 hours a day to provide individuals with complex communication needs a robust AAC system, or to provide language immersion and practice with complex access needs.

At the onset of the COVID-19 pandemic, we initially projected that in-clinic services in the AACcelerate program would be put on hold through at least August 2020. Since we already had fully registered participants for the program through August 2020, we conducted a re-assessment of program needs and created an action plan to provide quality, evidence-based services on the telehealth platform while preserving the integrity of the original program. This initial analysis indicated that tele-AAC intervention in the AACcelerate program could meet our client needs, and potentially allow for greater home carryover. Registered families were contacted immediately to gauge their interest in pursuing the program over the telehealth platform. They were provided with both evidence regarding the efficacy of tele-AAC, and our plans for how this would be reflected in the AACcelerate program. We thoroughly considered the particular clients registered for the program in the months of June, July, and August when making this program-wide decision, and did develop criteria for program appropriateness on the telehealth platform based on the decision making guides provided by AOTA and ASHA (AOTA, 2018; ASHA 2020). This program assessment included a SWOT (strengths, weaknesses, opportunities, and threats) analysis of three potential program plans: a full transition of the program to telehealth, placing the program on hold until in-clinic services resume, and creating a hybrid approach of both in-clinic and telehealth services.

At the time of our SWOT analysis, there was still uncertainty about the necessity or timeline of this transition, as new guidelines and ordinances regarding COVID-19 from local, state, and national agencies were updated regularly. Therefore, we created potential action plans for each of these options. Our detailed contingency plans for in-person and hybrid programs will enable us to quickly transition across settings, even mid-program. The plan for in clinic services included continuing the schedule as originally planned, with frequency and duration of services provided in the same way as they were pre-COVID-19. We created detailed plans for cleaning and sanitization of physical clinic space, materials, and equipment, as well as access to personal protective equipment. We also created guidelines for low-contact pick-up/drop-off, with caregiver ability to attend sessions via the telehealth platform. Additionally, we plan to continue to reference and utilize these documents, along with decision making tools provided by AOTA and ASHA, as we recognize the possibility of needing to quickly adjust between the telehealth and in-clinic models given the evolving circumstances COVID-19. At the time of this authorship, we are planning to move forward with AACcelerate on the telehealth platform through the summer of 2020. Many of the registered clients are medically fragile, and tele-AAC is the safest method of participation.

ENCOUNTERING TELEHEALTH IMPLEMENTATION BARRIERS

Throughout this tele-AAC program development process we encountered several potential barriers to implementation that we thoroughly addressed in order to offer a telehealth program to our clients and families that had similar clinical efficacy to the in-person program. Primary barriers to implementation of high-frequency tele-AAC consisted of addressing the clinical appropriateness of program dosage on the telehealth platform, AAC equipment availability, caregiver competency with both AAC and the telehealth platform, and therapist competency in telehealth. In response to each of these barriers we established

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new processes and structures to support client, caregiver, and practitioner needs, leaving room for further adjustment as the development of the pandemic could cause a swift transition to or from the telehealth platform for service provision.

SCHEDULING

The first barrier we addressed while planning this program transition was scheduling, including adjustment of frequency and duration of the program. We determined that three hours of screen time-based therapy consecutively each day for 4 days was too much, and that therapeutic value and efficacy for most clients would begin to decrease after 2 hours of consecutive treatment. At the time of initial planning, this was based on a small set of data we collected from AAC users who were beginning to successfully receive and tolerate two hours of consecutive tele-AAC services during the early stages of our company-wide transition to telehealth. We utilized this to create a new baseline schedule of services in the AACcelerate program, while keeping a similar total frequency and duration for continuity and clinical efficacy. The new schedule was adjusted to provide 1 hour of OT and 1 hour of SLP services daily, 5 days per week, for a total of 5 weeks. This adjustment provided 50 total hours of therapy throughout the program, in comparison to the 48 total provided in the original model. Families who were unable to commit to the additional week of time for high-frequency therapy services, were given the option to complete only 4 weeks of the program. With this schedule change came the need to adjust therapist's treatment schedules as well, which included decreasing the AACcelerate team size to only 2 OTs and 2 SLPs. We also ensured an administrator of each discipline on the treatment team, since they have more flexibility built into their schedules, and could potentially accommodate the changing schedule needs of the family or the program. This was especially crucial to consider due to the dynamic changes and unknown timelines resulting from developing "stay at home" orders, which had the potential to impact both the caregiver's work schedule and our clinic's transitions to and from telehealth and in-person therapy without much warning throughout the summer based on "safer at home" orders and insurance guidelines.

EQUIPMENT: ACCESS AND INTERFACING TECHNOLOGY

The second barrier we responded to was the multifaceted challenge regarding caregiver's access to and proficiency in both the telehealth platform and AAC equipment to be trialed and utilized with their child throughout the program. We used the Zoom for Healthcare telehealth platform, which is HIPAA compliant and accessible to users on a variety of technology including both tablets and computers by simply downloading the application. At the initiation of the transition to telehealth services, our company provided families with access to loaner iPad devices to access telehealth services if they did not have one. This applied to families completing the AACcelerate program as well.

After chart reviews of our incoming clients, we realized that the preparatory phase of the program would involve more attention to technology access over the telehealth platform. The team would need to work closely with the family to determine the AAC equipment that the participant may need to access throughout the program. Typically, we would have access to materials and equipment to trial in the clinic. In order to overcome this barrier, we created a robust planning document which included inventory of available equipment in-clinic, anticipated needs of new equipment for the overall program, and projected equipment required to trial with the client during the program. This document also included instructions and tutorials of each piece of equipment (e.g., switch interfaces, overviews of switches, etc.) which could be used by both treating therapists and caregivers when they are introduced to equipment. We also created an equipment loan contract, as we anticipate loaning equipment out to our clients. These are now documents that we have readily available for our practitioners to use, which will allow for therapist training and use with families as needed.

After reviewing patient history, consulting with the family about current physical status, developing general goal areas, and comparing these to our equipment inventory, we then worked to create a box of AAC equipment and tools to be delivered to them before the start of the program. When feasible we also provided treating therapists with matched similar equipment in order to allow for modeling, demonstration of setup and use, and troubleshooting over the telehealth platform. Throughout the months leading up to our first summer AACcelerate client on the telehealth platform, we have been able to trial this remote intervention system within 1:1 SLP and OT sessions focused on AAC and AT. This practice has allowed us to troubleshoot processes such as interfacing high-tech equipment over the Zoom platform (e.g., utilizing a switch interface system on the client end of a telehealth session to access a switch adapted computer game that the therapist shared on their screen). Though we realized the unique equipment utilized by each client had the potential to pose a number of unique technological challenges throughout the program, these months were instrumental in building a baseline of tele-AAC intervention skills among treating therapists.

HIPAA COMPLIANCE: PROGRAM COMPONENT ADJUSTMENTS

A handful of program components required adjustments to remain HIPAA compliant over the telehealth platform. Since a video home exercise program is a critical component of the AACcelerate program, we needed to take additional measures to ensure HIPAA compliance related to capturing a video recording over the Zoom platform. We created a video recording consent form in response to this, which was added as an addendum to the program intake forms. Additionally, the physical home

Assistive technology equipment boxes being packed for delivery prior to the beginning of AACcelerate to allow for virtual at home trials during the program.

program will be saved on a flash drive as a .pdf file along with embedded videos, and mailed to families upon program completion. We emphasize celebration of both small victories and long term achievements in the AACcelerate program, so both clients and therapists look forward to the program completion party on the last day of AACcelerate. To maintain this important part of our program on the telehealth platform we made plans to celebrate virtually, sending favorite treats and decorations to our clients and giving them the option to invite other family and friends to celebrate their achievements virtually.

TRAINING: THERAPIST AND CAREGIVER COMPETENCY

In order to ensure the clinical success of the virtual AACcelerate program we needed to ensure that both caregivers and treating clinicians knew how to utilize the telehealth platform. All therapists at our company were provided with training on the utilization of the platform when we began our broader transition to telehealth services. Throughout the months leading up to summer, those treating in the program were also provided with additional specialized training in tele-AAC. Caregivers were also provided with video tutorials about the use of the Zoom telehealth platform, and the first telehealth session was spent learning how to utilize features such as screen share, annotate, and microphone and video functions as appropriate. Additionally, in order to ensure baseline caregiver competencies regarding AAC equipment to be utilized in the program, we included written instructions and access to how-to equipment videos prior to the start of the program.

SILVER LININGS AND NEW DISCOVERIES

Through the process of tele-AAC program planning and implementation, we discovered many unanticipated opportunities and quality improvement measures for our AAC program. The necessity to relook at all of our existing program processes, materials, and services to meet the needs of our clients and families over the telehealth platform, resulted in overall quality improvement.v

TELECONSULTATIONS AND SYNCHRONOUS FOLLOW-UP

We initiated the use of a teleconsultation with the family and caregivers of participating AACcelerate clients two weeks prior to the beginning of the program in order to check in about the families' current status. This includes the location of the therapeutic services, and the current level of comfort with videoconferencing and AAC technology. We also used this consultation to check in about goal areas of interest in conjunction with the AACcelerate intake paperwork. During this, we discussed expectations for family involvement, as a high level of involvement of family support is indicative of success outcomes. Additionally, the opportunity to see the client communicating by video prior to their initial evaluation allows for more guided clinical decision making related to equipment and treatment planning. We will be continuing to utilize teleconsultation after the return to in-person services. We also plan to utilize the telehealth platform to ensure increased continuity of care post-program, especially for those clients and families who live in more remote geographic areas.

CONTINUITY OF CARE

Initiation of the use of the telehealth platform in the AACcelerate program has already had a positive impact on continuity of care before, during, and after program participation. Virtual consultations have improved not only the processes of screening for program fit and equipment planning as described above, but have also allowed for ease and efficiency of access to consultations for both new and existing CI clients. Prior to the use of this platform, new families completed a quick phone consultation and then scheduled a free consultation in the clinic. This sometimes took weeks to schedule, and the consultation was frequently with an intake coordinator only, as the AACcelerate program directors' schedules did not always allow for them to be present in the clinics where the consultations took place. The use of telehealth has allowed the program directors to almost always be at least virtually present in a consultation. The capabilities of telehealth have also helped to increase the number of appropriate program referrals from CI therapists who are seeing clients for 1:1 SLP or OT services. The program directors are now able to easily complete virtual consultations with both therapists and caregivers during a scheduled telehealth treatment session. Previously, this was challenging due to scheduling and

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Clients who use switch access can remotely engage in switch adapted computer games on platforms such as HelpKidzLearn Games & Activities, while the therapist shares their screen and initiates remote mouse control for the user to play using a switch interface tool.

feasibility of clinic-to-clinic travel time. During the program, the telehealth platform will allow for ease of observation opportunities and for collaboration with outside school, community, and hospital providers. The platform will also allow us to overcome two of the largest barriers we have faced regarding AAC client recruitment and participation: geography and illness/medical fragility. Clients from any geographic area within the state will no longer have to physically travel to our clinic in order to receive services in the AACcelerate program. Additionally, since the population we serve in the program has highly complex medical profiles and increased medical fragility, we project that we will see a decreased number of cancellations due to illness. Telehealth also allows for ease of follow-up, and our continued collaboration with family and outside providers following program participation.

PARENT AAC COMPETENCY AND HOME CARRYOVER

Both inside and outside of the AACcelerate program, a silver lining of AAC intervention via telehealth is that caregivers and family are more involved in direct treatment. Practitioners are able to provide strategies and implementation tips in real time and provide critique and feedback to meet the needs of the family where they are. The necessary detour to tele-AAC provided us with the opportunity to provide more frequent and meaningful parent training, to troubleshoot challenges with equipment in real time, and to see improved generalization of skills in the home environment. We have also seen improved parent confidence with AAC equipment and modeling, and plan to survey participating AACcelerate families on their perceived AAC competencies after full program completion this summer.

ADDITION OF ASYNCHRONOUS CONTENT

Prior to the conversion of our AACcelerate program to the telehealth platform, each participant would receive a home program and communication roadmap which included general AAC implementation tips and strategies for caregivers and communication partners. All home programs were supplemented with video content specific to these strategies and recommended equipment. Over the course of the program's first year running, we have developed a sizable library of asynchronous content that can be used by therapists for training and as additions to a client's home program. As we prepared for telehealth, we were forced to more quickly create equipment specific videos about setup, use, and troubleshooting for all AAC and AT equipment utilized in the program to provide to families along with their equipment kits. This expansion of resources has helped to speed the growth of our AAC and AT therapist training program as well. We are continuing to explore options for a virtual platform to house all of our asynchronous content that is both accessible and HIPAA compliant.

CI CONNECT: AACTIVITY HOUR

In the first few months of transition to the telehealth platform for all services at our clinic, our specialty, high-frequency programs were put temporarily on hold while we developed plans for service provision. During that interim period when we were not registering new clients for AACcelerate, we began to create innovative and alternative methods of serving this population. This included free and low cost AAC outreach programs and classes, on our company's new classroom platform, CI Connect.

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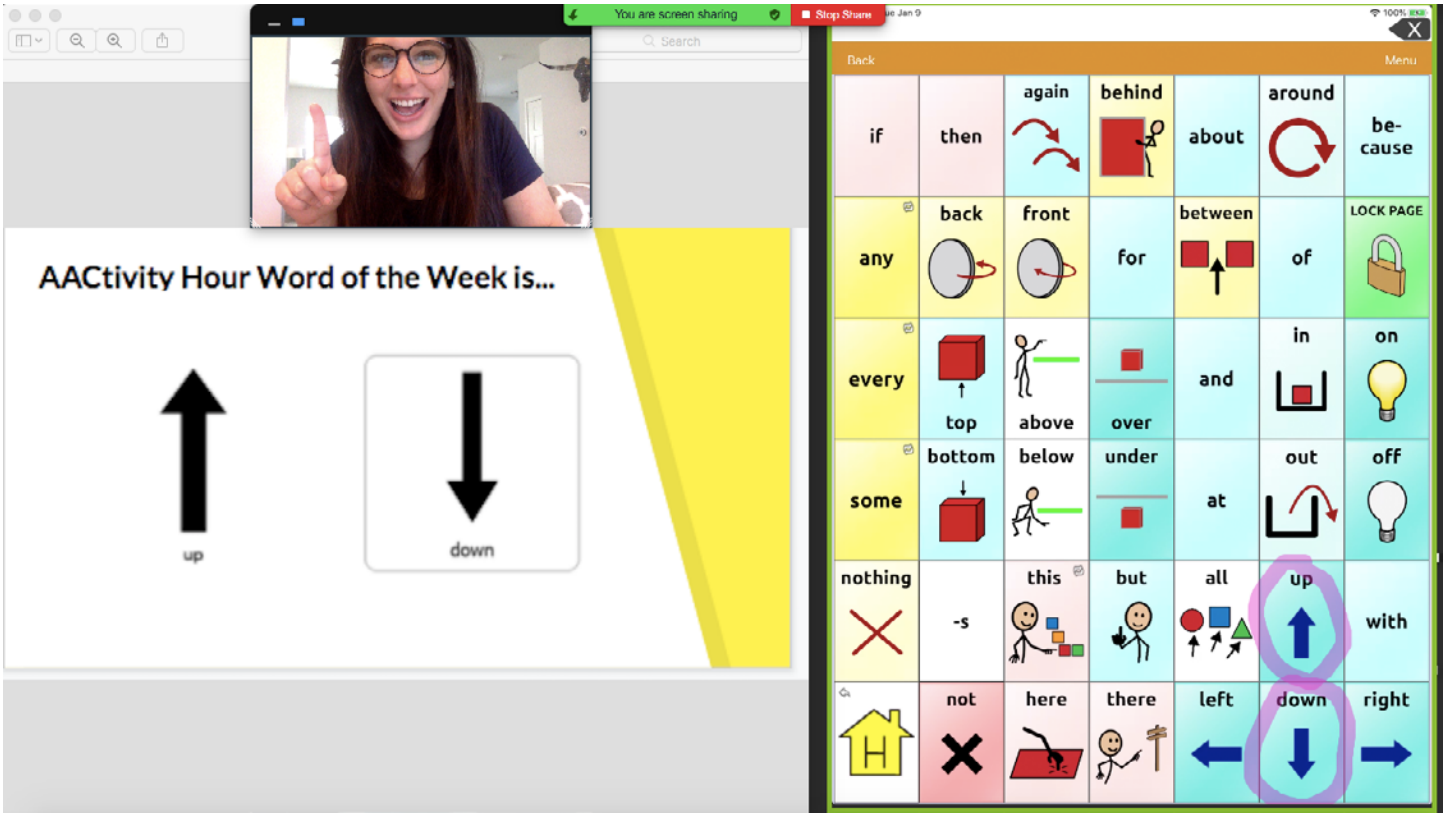

AACtivity Story Time brings symbol and sign language infused stories to life for AAC users of all ages and abilities. This class, along with AAC Accessible Yoga and AACtivity WOW! (Word of the Week) are open to the public. Check out www.ciconnectclasses.com for more information and updated class schedules!

We developed three weekly classes for AAC users. Curriculum was designed and facilitated by both SLP and OT practitioners who treat in the AACcelerate program. Our AACtivity Hour classes include a core word of the week class, an AAC story time, and AAC infused adapted yoga. CI Connect classes will continue to be prevalent as part of the services at our facility. The classes will allow us to supplement the therapy services provided in AACcelerate, to provide short respite opportunities to families, and to increase our geographic reach as all classes are open to the public.

THERAPIST TRAINING OPPORTUNITIES

Adoption of the telehealth platform for both traditional and high-frequency AAC has already vastly improved the interdisciplinary training opportunities for the generalists practitioners in our company. The ease of access to both online training materials and opportunities for remote observation in the AACcelerate program has the potential to result in a larger pool of service providers across our company who demonstrate the competencies required for treatment in this specialized program. This has positive implications for program PTO coverage and the expansion of the program to a larger variety of clinic locations. Another silver lining of tele-AAC during the COVID-19 pandemic is the increasing frequency of AAC co-treatment sessions provided by SLP and OT pairs via telepractice, and the opportunity to pair novice AAC practitioners with a seasoned therapist regardless of physical clinic location. This natural interdisciplinary mentorship opportunity will improve the quality of our AAC services both in and out of the AACcelerate program.

FUTURE DIRECTIONS: LASTING PROGRAM DEVELOPMENT IMPACT

The unexpected challenges created by the COVID-19 crisis have resulted in many exciting long-term program evolutions and potentially permanent program component additions. Throughout the summer months, we will be continuing with our typical data collection for the AACcelerate program, which includes utilization of goal attainment scaling to determine clinical program success, parent satisfaction feedback surveys, and treating therapist feedback surveys and interviews. This data will be utilized to determine the pros and cons of the AACcelerate program on the telehealth platform, and will contribute to continuous quality improvement measures implemented in the future. As we look towards the growth and movement of the program throughout the fall and beyond, we are excited to have the opportunity to integrate telehealth components we have developed as a result of this crisis to supplement and improve upon the AACcelerate program as it is offered in the clinic set-

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ting. We also envision the potential for the program to run with a hybrid service delivery model, with both in-person high-frequency treatment and tele-AAC. This will include increased use of asynchronous content in the program including video models of specific strategies and interventions, creation of even more robust home programs, and a platform for access to parent education videos on equipment use and troubleshooting. We also project using the telehealth platform to provide synchronous follow-up appointments to all families who participate in the program, whether in the home or remote clinic settings, to improve home carryover and care coordination with other providers on the AAC user's interdisciplinary team.

For more information on the AACcelerate program or other therapy services offered at CI Pediatric Therapy Centers, visit our website at www.citherapies.com. We offer free phone, telehealth, and in-person consultations. If you would like to try out one of our free or low-cost AAC classes on CI Connect, visit www.ciconnectclasses.com.You can also follow us on Facebook, Instagram, and YouTube for updated information about our special programs and classes.

PRODUCT INFORMATION:

Zoom for Healthcare

Zoom for Healthcare is a telehealth platform designed specifically for healthcare providers, which provides consistent, high-quality video and audio, HIPPA/PIPEDA compliance, AES encryption, and medical device and EMR integrations. Plans begin at $200.00 per month per account. https://zoom.us/docs/doc/Zoom%20for%20Healthcare.pdf

HelpKidzLearn Games & Activities

HelpKidzLearn Games & Activities is an accessible online computer gaming platform that can be utilized with alternative access methods including switches, touch screen, joy stick, and eye gaze. It is appropriate for use with a variety of learners with diverse developmental and access needs. A subscription for a clinical site costs $265.00 per year, with options for single user accounts beginning at $10.99 per month. https://www.helpkidzlearn.com/shop/online-software/games-and-activities

CI Connect Classes

CI Connect is an online learning platform developed by CI Pediatric Therapy Centers, which provides classes and clubs run by occupational, physical, speech language, and recreation therapists for children and young adults of all ages and abilities. Classes, which are open to the public, cost $5.00 each. All classes are free on Fridays! You can sign up at www.ciconnectclasses.com.

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Providing Equity
Through Accessible Media

Research shows that the use of multimedia as an educational tool is beneficial to all students.

Videos are uniquely suited to take students on impossible field trips, introduce them to new people and cultures, and bring great literature to life. Videos can reach children with a variety of learning styles, engage students in problem-solving and begin to dismantle social stereotypes. When used correctly, videos enhance learning and motivate students.

However, many educational videos do not take into account accessibility. They are not captioned or described. Captions are critical for the understanding of students who are deaf and hard of hearing. Audio description provides essential visual information for students who are blind and visually impaired. These accessibility features are not new. In fact, captions are used by many people, whether they have hearing loss or not. But producers of educational media often work on a tight budget and do not see the cost benefit of adding these features. Therefore, it is even more important that educators understand these features and their importance to all students.

CAPTIONS

Captions are the textual equivalent of what is being said in a video, and they are time synced with the audio. But they include more than just the dialogue; they also include speaker identification, sound effects and music description. A variety of terms are used to label captions in online media, broadcast content and DVDs. Broadcast content uses "closed captions," which means the captions can be turned on or off. There are also "open captions," which are part of the video and cannot be turned off. Online media and DVDs often use the term "subtitles." Subtitles are intended to provide a translation of the spoken content for individuals who speak a different language than that of the video. Captions are different from subtitles in that they are intended for individuals who are deaf and hard of hearing. Captions include all auditory content, not just what is spoken.

Captions provide access for individuals who are deaf and hard of hearing, but they also benefit everyone. They promote literacy for children and adults by strengthening reading speed, comprehension, spelling and grammar skills. They improve clarity and comprehension of the sounds and dialogue, particularly when poor audio, heavy accents, background noises and other such media elements are present. They allow individuals to follow along with the dialogue even when they do not have access to sound on their computer or mobile device (e.g., in a noisy area with no headphones, or when using devices with faulty or missing sound cards or drivers).

Captions are becoming more and more mainstream; the quality of the captions is much more evident when everyone can use them. The FCC requires that captions on broadcast television be: accurate, synchronous, complete and properly placed. More information can be found on the FCC website. The Described and Captioned Media Program (DCMP) has more in-depth standards in their Captioning Key, which is researched-based to provide the most readable and accessible captions for all levels, children through adults. Often, videos are captioned using the "easiest" method possible, and less skilled readers are not taken into ac-

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count. A person who is fluent in English and proficient in reading can easily understand captions that are less than ideal, such as those that are in all capital letters. Research has shown that words in all capital letters are more difficult to read and slow down the reading process. While an adult whose first language is English can read captions that are in all caps without difficulty, a child who is not a skilled reader or a person whose first language is not English will likely struggle.

Another shortcut to captioning that is frequently discussed is automatic speech recognition software. One example that many people are familiar with is YouTube's automatic captions. These are usually far from accurate and often cause more confusion than no captions. An additional drawback is they inadvertently add incorrect words such as profanity. It is not only embarrassing but also inappropriate to use these captions with students. Technology has improved tremendously and there might come a day when captions can be automated, but it is not currently possible.

Educational videos need the highest quality of captions because students are learning important content. This is doubly true for students who are deaf or hard of hearing and depend on the captions to access the meaning of the video.

DESCRIPTION

Equally important is description for students who are blind or have low vision. Description is the verbal depiction of key visual elements in media and live productions. Also known as "audio description" or "video description," the description of media involves the interspersion of these depictions with the program's original audio. A second type of description is known as "expanded description." When a video has many key visual elements but very little pause in dialogue, the video may be paused so that additional description can be added. This can be especially helpful with math and science videos, which tend to have a lot of dialogue and critical visual components.

Description is the key to opening a world of information for persons with a vision loss or literacy needs. The American Foundation for the Blind reports that 26.9 million American adults have vision loss and 568,202 children with vision difficulties in the U.S. While description was developed for people who are blind or visually impaired, sighted children may also benefit from description's concise, objective translation of media's key visual components. Specialized learners, such as students with learning differences, English language learners, and children on the autism spectrum, can benefit from its value in literacy development (e.g., vocabulary and reading) and content learning. DCMP's Listening is Learning campaign focuses on these benefits.

The amount of description available on broadcast television and popular movies lags behind closed captioning. In the 1990s, the FCC set up a tiered approach to mandate that an ever-increasing amount of broadcast content be captioned. Today, very little programming is exempt from this regulation. The FCC mandated that major broadcast networks and cable companies provide 50 hours of described programming per quarter by April 2002. The amount has increased since, but there is still very limited availability of described programming. The problem is even more dramatic in the area of educational media, as less than 10% of educational media is described.

The purpose of educational media is to engage students and enhance learning. This will not happen for students who are visually impaired if the media does not contain high-quality description. The DCMP *Description Key* states that description must be:

- **Accurate:** There must be no errors in word selection, pronunciation, diction or enunciation.
- **Prioritized:** Content essential to the intended learning and enjoyment outcomes is of primary importance.
- **Consistent:** Both the description content and the voicing should match the style, tone and pace of the program.
- **Appropriate:** Consider the intended audience, be objective and seek simplicity and succinctness.
- **Equal:** Equal access requires that the meaning and intention of the program be conveyed.

THE DESCRIBED AND CAPTIONED MEDIA PROGRAM (DCMP)

Because videos are a popular medium for teachers and many educational videos are not accessible to students with disabilities, teachers may try to find work-arounds or simply not use video. Neither of these is an appropriate solution. Video can be a great teaching tool, and accessible media enhances the learning opportunities for all students. The best solution is to use educational media that comes with high-quality accessibility features.

This is where DCMP can help. DCMP maintains an online video library of over 8,000 educational titles that are captioned and described. The project is funded through the U.S. Department of Education and administered through the National Association of the Deaf. All services are free of charge.

This may sound too good to be true, but it is a truly free resource for parents and educators. To access the online videos, membership is needed. There is a simple online form to fill out. Then an email is sent out to verify that the application email is an active address. Once the email is validated, DCMP staff will review and approve qualified applicants, then information is sent about how to access the account. Family members and professionals with early learners through Grade 12 students who are deaf, hard of hearing, blind, visually impaired or deaf-blind qualify for membership. If for some reason a person does not qualify for a full account, DCMP's collection offers over 1,000 videos that are Open Educational Resources (OER), meaning they are available to everyone.

Another DCMP resource that is open to everyone is the Learning Center. It contains hundreds of posts on education, accessibility and advocacy as well as captioning and description stan-

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dards in the *Captioning Key* and *Description Key*.

Families of these children can use DCMP resources at home. For example, if a family learns their newborn child is deaf, they can begin learning sign language through videos in the DCMP collection. They can also learn about other language options and educational choices for their child. As the child grows, there are ASL storytelling videos they can watch. Then when the child enters school, there will be videos for use in the classroom.

Teachers and other professionals can use DCMP media in the classroom but also for professional development. Series such as *Physics Girl*, hosted by MIT graduate Dianna Cowern, help teach high school students about physics through experiments, demonstrations and cool new discoveries. Teachers wanting to learn more about working with students who are deaf and students who are blind will enjoy the *FSDB Pineapple Professional Development* series. This series demonstrates teaching methods and instructional strategies for best practices in the classroom. As long as a teacher has one qualifying student, they are eligible for a free account and can use DCMP materials in all sections of that class, even if there is only one qualifying student in one section.

DCMP has educational videos for early learners through high school and into transition. There are videos on all academic topics: math, science, language arts, history and much more. But there are also videos on topics such as building social skills, self-advocacy, resilience and others. DCMP has videos on a broad range of topics to support a well-rounded education and healthy life habits.

The media in the DCMP collection is all high-quality educational content. These videos are commercially produced by companies such as PBS Digital Studios, PBS Learning Media, History Channel, Sesame Studios, The Fred Rogers Company, Universal Kids, National Geographic, National Science Foundation and Scholastic, to name a few. Additionally, the videos are correlated with Common Core and state standards. Each video page shows a link to "Standards" along with production information. A person who is logged into their account will see standards listed for their state, as the system automatically connects with that member's information. The member can then view all standards the video matches and search for additional videos that meet those standards. It is easy to search for videos that teach a specific standard and to document which standards a video meets.

DCMP media can be accessed through almost any Internet-enabled device: standard computer, laptop, tablet or smartphone. There is an iOS app, a Roku channel and an Apple TV channel. Most videos are also available on DVD because some DCMP users do not have reliable Internet service for streaming videos or they might prefer DVDs to play during long road trips. DVDs can be ordered at no charge, as DCMP pays postage for shipping and return. Those using an app or specialized device to access DCMP media should not forget to check out the website periodically. It contains additional features and more than just the media library.

The DCMP website allows members to set browsing preferences so they can narrow their search for media. The grade level, accessibility feature, and runtime can be set as filters. DCMP has content in English and Spanish, both captioned and described. For example, a middle school teacher with a student who is blind can set browse preferences of grade levels to 4-6 and accessibility to English description. This will filter the search results and provide videos that will match specific needs.

DCMP uses player-based captions and description, which means the user has more flexibility and control over the viewing experience. When viewing captions, the text size, style and color can be modified, as well as the background color. This allows customization for students who may be deaf and low vision, or a student who just prefers a specific style of captions. If a video is available in both English and Spanish, the user can choose to play the audio track in Spanish and show English captions. This is great for bilingual families or English language learner (ELL) students. Captions and description can be played simultaneously. This is helpful if a teacher happens to have a student who is deaf and a student who is blind in the same class, or a student with both hearing and vision loss. Another customization feature is the playback speed. The playback speed can be slowed to allow students who are deaf more time to take in the visuals and the captions. Actually, this feature can be beneficial to all students, since some academic videos can be fast paced. Slowing it down can allow everyone more time to process the information.

DCMP videos also come with a transcript. On each video page, there is a button below the video for "transcript." The system will default to the caption transcript; however, users can choose the description transcript, or both. This feature allows users to search through the video to find specific words and phrases. The

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user can then jump to that point in the video. Additionally, transcripts can be downloaded. They can be provided to students to use as a study guide or to highlight for notes. They help teachers pre-teach vocabulary. They also provide accessibility to students who are deaf-blind. These students can be given an electronic copy of both the captions and description transcripts, and then use technology to access it or be given a copy in braille.

COMING SOON

Two more exciting features that will be launching soon are Clip Builder and Lesson Builder. Clip Builder will allow teachers to select a segment of a video and play only that segment or select segments from multiple videos and create a playlist. This will make it easy to play clips of the same topic from different sources so that students can be exposed to the topic multiple times in various ways. Lesson Builder will allow teachers to insert quiz questions in between video clips, permitting a student to watch a few minutes of a video, then answer questions before being allowed to move on. This interactive approach is designed to motivate students and enhance learning.

To increase student involvement, teachers/parents can set up student accounts. Typically, students are not allowed to have full access accounts because not all media is appropriate for all age levels. DCMP wants to ensure that sensitive topics are monitored by a teacher or other adult. However, the adult member can create an account for their student(s). The teacher/parent sets up the account and then decides which videos the student will have access to. Access can be given by grade level and category or by individual video. For example, the adult can give access to content through Grade 6 in the categories of mathematics, language arts and history. They can also choose individual videos the student can watch. In this way teachers can use the flipped classroom model, where the students watch a video at home and then discuss it in class. They can assign videos as additional content to support a lesson. They can also allow access to videos that can be used as a reward. For example, if students complete work early, they are allowed to watch a video of their choosing from their DCMP account.

DCMP has many videos that can be labeled edutainment. These are videos that are entertaining for the students but have educational goals. Some popular titles in this category are: *Bill Nye the Science Guy, Paw Patrol, Daniel Tiger's Neighborhood, Dog Whisperer, Top Chef Junior, Peg + Cat* and many more. These videos can be rewards for students, and they may never realize they are still learning.

In addition to content for students, DCMP also has content labeled Adults & Educators. This content is intended for the adults to learn more ways to help their students. There are videos about specific disabilities and what parents and teachers need to know. There are videos about teaching strategies. There are videos on encouraging self-advocacy, promoting good mental health and strategies for preventing bullying. There are also opportunities for teachers and professionals to earn continuing education units (CEU). DCMP offers three formats for professionals to earn CEUs: modules, workshops, and QuickClasses. Modules and workshops are shorter, self-paced trainings. QuickClasses are three-week, facilitated, asynchronous, online courses. All who successfully complete a training will receive a certificate for their records. Additionally, the trainings are pre-approved for credit with ACVREP (Academy for Certification of Vision Rehabilitation & Education Professionals) and RID (Registry of Interpreters for the Deaf).

For those working with older students, DCMP offers a multitude of transition-related resources. There are videos that explore various career options as well as videos for learning how to write a résumé and go on a job interview. There are also online modules which provide more in-depth information and interaction: *Getting a Job! for Students Who Are Blind and Visually Impaired*, *Getting a Job! for Students Who Are Deaf and Hard of Hearing*, and *Map It: What Comes Next?*.

DCMP provides services designed to support and improve the academic achievement of students who are blind, visually impaired, deaf, hard of hearing, or deaf-blind. The ultimate goal of the DCMP is for accessible media to be an integral tool in the teaching and learning process for all stakeholders in the educational community, including students, educators and other school personnel, parents, service providers, businesses, and agencies.

We often think the goal of captions and descriptions is to provide equal access for individuals with disabilities. However, accessible features benefit everyone and support the goal of Universal Design. Making media accessible increases the learning potential for all students. Poor-quality captions and descriptions benefit no one. To quickly and easily find accessible, educational media, look no further than The Described and Captioned Media Program. ■

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Reader Pen:

Opening Doors for Individuals with Literacy Difficulties

Summary: Paper has always been inherently inaccessible. Although traditional text-to-speech programs have allowed students to access the curriculum through the use of a personal computer, paper continues to persist as a reality in the world of communication. This article will discuss how the Reader Pen, a pocket-sized device that reads text aloud, has opened a new world for students in post-secondary with dyslexia and other literacy difficulties.

GEORGIAN COLLEGE
CICE PROGRAM

Students in the Community Integration through Co-Operative Education (CICE) Program at Georgian College in Barrie, Ontario, Canada have been utilizing the Reader Pen as a tool to access the curriculum and materials in the workplace and in their day-to-day lives. The CICE Program is designed specifically for adult learners with diverse learning challenges who require academic accommodations and modifications in order to be successful in accessing the curriculum. It is truly an access program which is opening doors for students who wouldn't typically be able to consider a college education. Students work towards earning an Ontario College Certificate focusing on essential employability skills in order to find meaningful entry level work. CICE students have an opportunity to enhance their vocational skills through field-placements. Students are accompanied to integrated class by Learning Facilitators who modify integrated courses to students' specific strengths and abilities, and provide accommodations, tutor and support sessions to ensure the work is challenging yet achievable.

Despite living in a digital world, print based text is everywhere. Paper has always been inherently inaccessible for many students. Although traditional text-to-speech programs have allowed students to access the curriculum through the use of a personal computer, paper continues to persist as a reality in the world of communication. The Reader Pen, a pocket-sized device that reads text aloud, has opened up a new world for students in post-secondary who live with dyslexia and other literacy challenges.

Dyslexia Canada reports that "15-20% of the population has a language-based learning disability".

A plain language definition from the Yale Centre for Dyslexia and Creativity:

"Dyslexia is defined as an unexpected difficulty in learning to read. Dyslexia takes away an individual's ability to read quickly and automatically, and to retrieve spoken words easily, but it does not dampen their creativity and ingenuity."

According to the International Dyslexia Association, "up to 15-20% of the population as a whole may have symptoms of

FERNANDA BIANCONI is a Learning & Adaptive Technology Facilitator and Faculty Member for the Community Integration through Co-Operative Education (CICE) Program at Georgian College in Barrie, Ontario, Canada. In her role, Fernanda supports students with diverse learning challenges who require academic accommodations and modifications in order to be successful in their post-secondary studies. More specifically, she encourages her students to utilize their adaptive technology in order to maximize their overall achievement.

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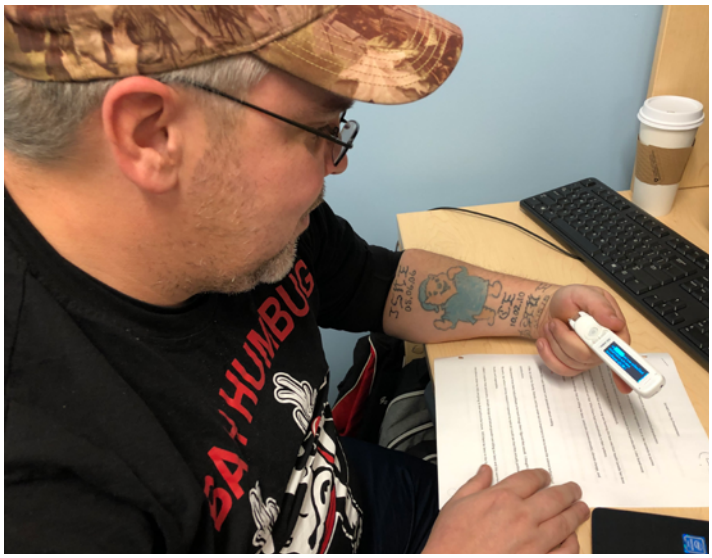
dyslexia, including slow or inaccurate reading, weak spelling and poor writing".

For many of our students, reading from traditional textbooks can be exhausting. Frustration with the physical act of reading often deters students from enjoying literature.



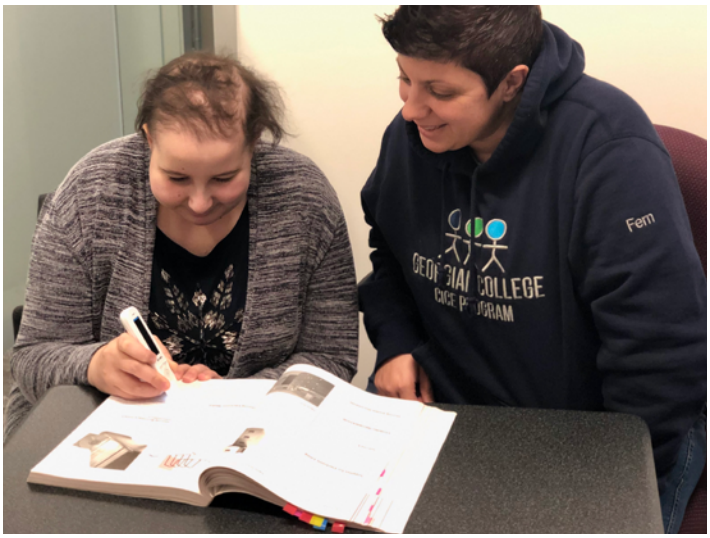
CICE Student using the Reader Pen to independently read printed text.

G.E., a student in the CICE program describes the device as a "game changer". "As a mature student, and someone with a reading disability, I worried about going back to school at 39, with kids of my own at home. School was always a challenge for me growing up and college was out of the question. When I learned about the CICE Program, I thought this might be my chance. When I started at Georgian College, I learned about all kinds of technology to help me with my learning. The Reader Pen was by far the game changer for me. Not only does it help me with reading at school, but I use it at work and at home. For example, I love to cook. The Reader Pen lets me be able to read recipes in the kitchen without having to ask for help. If I get stuck on a word, I just scan it and then carry on with what I'm doing. The biggest thing for me though is that now I can help my kids with their homework. You have no idea how hard it is for a father to not be able to read a book to your kids. I used to get so frustrated and felt like such a failure, but now if I get to a word I don't know, I just scan it with my Reader Pen. It helps my kids too because sometimes they'll ask to use it. So, like I said, it's been a game changer for me".

From day-to-day classroom work to test taking, the Reader Pen has transformed the way CICE students with dyslexia and other literacy difficulties learn. For Learning Facilitators, the device has changed the way traditional classroom and test taking support is provided. Students are far more independent in their learning when using the Reader Pen. Where once they would rely on their Learning Facilitator to provide a digital copy of text, they now are able to be in control of their own education. The dictionary feature enhances and encourages students to independently look up the meaning of words increasing their knowledge of new concepts and ideas. In test taking situations, the Reader Pen has eliminated the need for human readers or traditional text-to-speech programs on computers.

Rebecca Dewar, Field Placement Officer in the CICE Program explains that, "often times students hesitate with using their adaptive technology in the workplace. There are fears around what the employer or coworkers might think. With the Reader Pen, students see it as a tool to get the job done. It's amazing to see how it has changed their mindset".

Not only have CICE faculty seen an increase in comprehension and test scores, they have also reported that the device has had a positive impact on students' confidence and independence. The Reader Pen eliminates the anxiety and fear many students have around reading. The emotional benefits of this device have further reaching impact as students receive increased choice in what material they read, when they read it and the privacy it affords.



CICE Student using the Reader Pen to read from a textbook.

CICE Alumni, E.G. explains that "the Reader Pen has helped me both in and outside of school. I loved using the Reader Pen in class, and no one knew what it is because it looks just like a highlighter. It doesn't look like a foreign device and I never felt like it made me stand out. I used the Reader Pen at my field placement to help me independently read words that were on paper without having to ask someone for help. I take my Reader Pen everywhere with me. I even took it on my family vacation and used it to help me read the itinerary, menu and other things. The Reader Pen has changed my life!"

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The Reader Pen by Scanning Pens has a simple premise. Scan a line of printed text, and it will read the text aloud for you.

There are ***five main features*** of the device:

1. **Text Reading** – Using optical character recognition (OCR) technology, the device will read most fonts size 6.5-22 point. As the individual scans a word, paragraph or full pages of text, words will appear on the OLED display. The Reader Pens features high quality naturally speaking English (American, Australian, British, Irish, Scottish or Indian accents), Spanish (regular or Latin accents) and French voices.
2. **Dictionary** – Unsure of a word? The Reader Pen contains high quality electronic dictionaries. Individuals simply capture the word(s) with the device and use the dictionary to look up the meaning of that word. The device will remember the words that users have looked up and keep a history available for them to refer to. It comes preloaded with the Collins English Dictionary or Oxford French & Spanish Dictionaries.
3. **Voice memos** – The Reader Pen has a built-in microphone to record simple reminders about a reading in .mp3 or .wav format. The audio files are saved in the device so they can be retrieved and listened to any time. Students often use this feature to make notes of their readings and then transcribe the audio file using Dragon NaturallySpeaking on their personal computer.
4. **Scanning to File** – The device has 8Gb of storage which allows students to scan text to file. This feature enables students to instantly capture and save the text onto the device so they can transfer it to their personal computer (Mac, PC, Linux & Chromebook) in a .txt file.
5. **Character Scanning** – This feature allows students to scan text directly to the cursor on their computer. As they scan a word or line of text, it will instantly appear on the screen.

Fernanda Bianconi at the ATIA 2019 Conference in Orlando, FL.

"I really don't like when I have to get a Learning Facilitator or someone to read to me. I want to be able to do it on my own. A lot of the time I'll just say that I don't need help and can do it by myself when really, I can't. That just makes me get frustrated. With my Reader Pen, I can scan whatever it is and read by myself. If I don't know what a word means, I just look it up by myself. Like, I can actually do my work alone!" ~ M.S. CICE Student

As much as the Reader Pen has many positive characteristics, I have become aware through utilization of the device that there are both benefits and drawbacks.

BENEFITS:

- Empowers students with dyslexia or other literacy difficulties
- Students are more engaged in their learning as they are no external distractions
- Eliminates the need for a human reader or digital copies
- Builds comprehension and enriches writing
- A professional "tool" as it eliminates the preconceived notion that someone who is using their computer or smart phone is not doing anything constructive
- Voice recorder allows students to record specific parts of a professor's lesson or create voice memos of key points which can later be transcribed
- Portable device that works anywhere, anytime, in any lighting condition
- Scans text in English, French and Spanish
- built-in dictionaries allow students to look up any word they do not understand
- Customizable for left or right-handed users
- Compatible with Mac, PC, Linux & Chromebook devices

DRAWBACKS:

- Students need to have good dexterity in order to use the device effectively

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- Unable to read fonts smaller than 6.5 point or larger than 22 point
- Font style, size and color cannot be customized to the user
- Only reads typed text
- Storage is limited to 1Gb
- Students must be patient and intentional when scanning

TIPS FOR USING THE READER PEN:

1. It is important to remember to hold the pen at a 75º angle for accurate scanning
2. When scanning text, hold the OK button to enlarge a specific word
3. Struggling with understanding the mean of definition? Switch to the Oxford Primary Definition.
4. Charge your Reader Pen each night to ensure it is ready to use the next day

In conclusion, the Reader Pen is an essential tool for students in the CICE Program at Georgian College. Students are able to keep their self-esteem intact as they can use the device to read information from a written page in a private manner. As well students can determine definitions of words, record voice memos or parts of lessons, and scans text in multiple languages. It is discreet and portable which makes it easy for students to carry anywhere they go. The device is a valuable tool that students can use as they transition from school, to the workplace, to life in general. The benefits can continue to be optimized in very practical ways with little effort and make such a positive difference in the lives of those who use it. The Reader Pen has revolutionized learning for many students at Georgian College.

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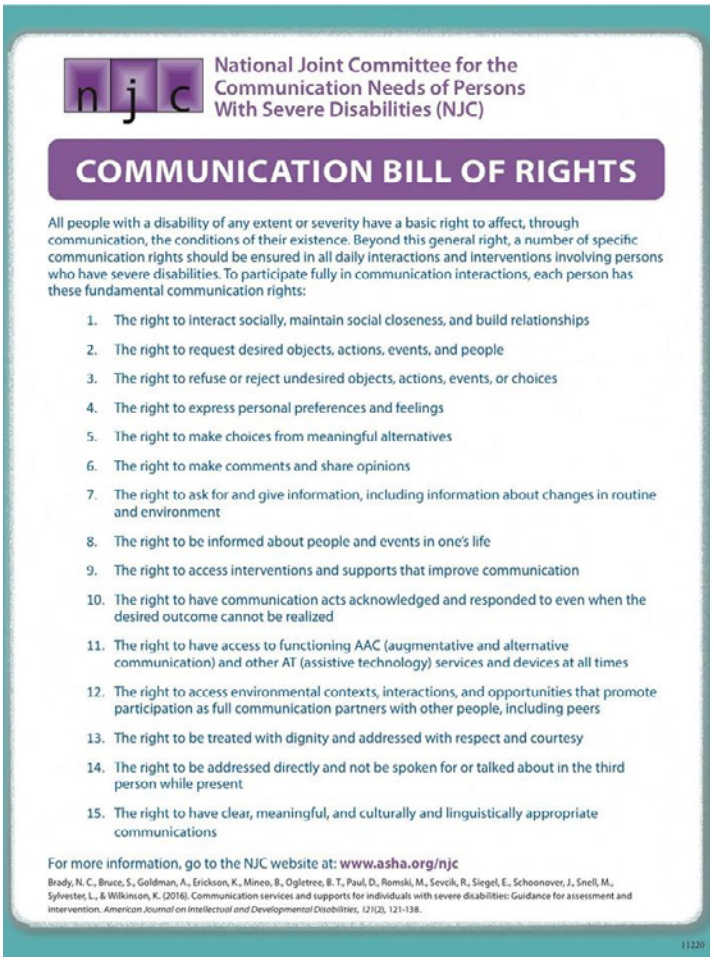
Finding Your Voice
During Remote Learning

One night recently, my husband and I were having dinner. As we usually do, we were discussing our day. Tonight, however, we got on the topic of remote learning. My husband and I pondered how our lives might be different if we grew up in the age of distant learning. How would your life be different if you grew up in the age of online/ remote learning?

EVERY STUDENT DESERVES A VOICE

For the last two years, making sure that every student has a voice has been my crusade. I have shared my words and my vision with anyone who would listen. Today's technology tools can give a voice for all learners to communicate in the school environment. Regardless of student ability, all students should have the tools needed to successfully get their point across, get their wants and needs met and feel comfortable sharing their experiences in the school and now remote setting. Voice and choice are rights that should be afforded to every individual, regardless of disability, ethnicity, culture, gender and age.

In 2016, Brady et al. shared the "Communication Bill of Rights," a National Joint Committee for the Communication Needs of Persons With Severe Disabilities (NJC). The article titled "Communication services and supports for individuals with severe disabilities: Guidance for assessment and intervention" featured in American Journal on Intellectual and Developmental Disabilities shared 15 fundamental tenets that all people with disabilities should have. During remote learning, we have learned that these tenets have never been more needed. We have also learned that by using technology, individuals with disabilities have access to the tools to share their voice.



National Joint Committee for the Communication Needs of Persons With Severe Disabilities (NJC)

COMMUNICATION BILL OF RIGHTS

All people with a disability of any extent or severity have a basic right to affect, through communication, the conditions of their existence. Beyond this general right, a number of specific communication rights should be ensured in all daily interactions and interventions involving persons who have severe disabilities. To participate fully in communication interactions, each person has these fundamental communication rights:

1. The right to interact socially, maintain social closeness, and build relationships
2. The right to request desired objects, actions, events, and people
3. The right to refuse or reject undesired objects, actions, events, or choices
4. The right to express personal preferences and feelings
5. The right to make choices from meaningful alternatives
6. The right to make comments and share opinions
7. The right to ask for and give information, including information about changes in routine and environment
8. The right to be informed about people and events in one's life
9. The right to access interventions and supports that improve communication
10. The right to have communication acts acknowledged and responded to even when the desired outcome cannot be realized
11. The right to have access to functioning AAC (augmentative and alternative communication) and other AT (assistive technology) services and devices at all times
12. The right to access environmental contexts, interactions, and opportunities that promote participation as full communication partners with other people, including peers
13. The right to be treated with dignity and addressed with respect and courtesy
14. The right to be addressed directly and not be spoken for or talked about in the third person while present
15. The right to have clear, meaningful, and culturally and linguistically appropriate communications

For more information, go to the NJC website at: www.asha.org/njc

Brady, N. C., Bruce, S., Goldman, A., Erickson, K., Mineo, B., Ogletree, B. T., Paul, D., Romski, M., Sevcik, R., Siegel, E., Schoonover, J., Snell, M., Sylvester, L., & Wilkinson, K. (2016). Communication services and supports for individuals with severe disabilities: Guidance for assessment and intervention. *American Journal on Intellectual and Developmental Disabilities, 121*(2), 121-138.

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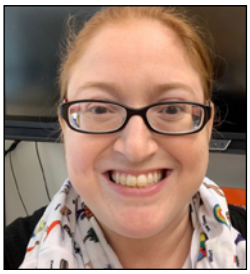

MELISSA STARK is a special education and Ed Tech Model teacher at P94M in New York City's Department of Education, which is part of District 75. District 75 serves students with significant disabilities. She is a Microsoft Innovative Educator Expert, as well an Ambassador for Book Creator, Tobii Dynavox, Kahoot! and FlipGrid Student Voice. She is also an Apple Teacher. Melissa has presented at ISTE, EdxEdNYC and New York City's Department of Education Technology Summits focusing on making curriculum more accessible to all. She has also supported staff members on using communication supports in the classroom.

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THE COMMUNICATION BILL OF RIGHTS

According to Brady et al., "All people with a disability of any extent or severity have a basic right to affect, through communication, the conditions of their existence. Beyond this general right, several specific communication rights should be ensured in all daily interactions and interventions involving persons who have severe disabilities." Remote learning has put some of the tenets to the test. For individuals with disabilities and the staff and families who support them, our goal is to keep intact the following principals with the support of technology:

THE RIGHT TO INTERACT SOCIALLY, MAINTAIN SOCIAL CLOSENESS AND BUILD RELATIONSHIPS.

All individuals with disabilities have the right to retain the circle of friends and supports in their life. They have the right to build upon those close-knit relationships and have them grow. Also, the information should be shared on why people that they typically see each day are now not part of their daily routine.

THE RIGHT TO REQUEST DESIRED OBJECTS, ACTIONS, EVENTS, AND PEOPLE

All individuals with disabilities have the right to request the items they want and need. They should be allowed to ask for people they want to see activities that are important to them, and objects that are fun for them to do.

THE RIGHT TO REFUSE OR REJECT UNDESIRED OBJECTS, ACTIONS, EVENTS OR CHOICES.

All individuals with disabilities have the right not to want to complete an activity or go somewhere. They should œafforded the same rights as their peers who are allowed to make the same refusals.

THE RIGHT TO EXPRESS PERSONAL PREFERENCES AND FEELINGS

All individuals with disabilities are allowed to have their personal ideas and thoughts. As teachers and support staff, we cannot assume we know how a student feels about an activity, person or object, and must give an individual with a disability the right to express their feelings.

THE RIGHT TO MAKE CHOICES FROM MEANINGFUL ALTERNATIVES

All individuals with disabilities are allowed to substitute appropriate items. During remote learning, we need to make sure we are giving all individuals the ability to choose options when available. If the cheese sandwich requested is no longer an option, the individual should be able to choose what they would like to eat.

THE RIGHT TO MAKE COMMENTS AND SHARE OPINIONS

All individuals should be able to share their ideas and thoughts. Not everyone is going to like the same things, and everyone is going to have a different take on activities, jokes and conversations.

THE RIGHT TO ASK FOR AND GIVE INFORMATION, INCLUDING INFORMATION ABOUT CHANGES IN ROUTINE AND ENVIRONMENT

All individuals should know (to the best of everyone's ability) when life is going to change directions. Distance learning has shown us that while sometimes we cannot know when every change is being made, we can share what we do know is happening, and we also can share changes that we did not were about to go on during and after the fact.

THE RIGHT TO BE INFORMED ABOUT PEOPLE AND EVENTS IN ONE'S LIFE

All individuals with disabilities deserve to know what is happening to the people in their lives. They deserve to know that someone that has been by their side for years is no longer there or that they will not be able to see a friend until they are back at school. Being informed is vital to build strong bonds and keep trust.

THE RIGHT TO ACCESS INTERVENTIONS AND SUPPORTS THAT IMPROVE COMMUNICATION

All individuals with disabilities have the right to have any support (from low-tech to high-tech) that will help them communicate. The right to access interventions and supports may also include ways to help position themselves. If certain activities or items cannot be shared, then individuals deserve to have "meaningful alternatives" to help them be able to communicate.

The right to have communication acts acknowledged and responded to even when the desired outcome cannot be realized.

All individuals with disabilities have the right to be acknowledged by a communicative partner, even if that want cannot be granted. Everyone has a voice and should be shown that they are heard.

THE RIGHT TO HAVE ACCESS TO FUNCTIONING AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC) AND OTHER AT (ASSISTIVE TECHNOLOGY) SERVICES AND DEVICES AT ALL TIMES

All individuals with disabilities have the right to have their device working. Back-up methods should be developed, or plans should be put in place to support our AAC and AT users. This will also help plan for those who support our individuals with disabilities.

THE RIGHT TO ACCESS ENVIRONMENTAL CONTEXTS, INTERACTIONS, AND OPPORTUNITIES THAT PROMOTE PARTICIPATION AS FULL COMMUNICATION PARTNERS WITH OTHER PEOPLE, INCLUDING PEERS

During remote learning, all individuals with disabilities should be able to have communicative partners, especially peers, that can help them continue to focus on dialogue and social communication about the world around them.

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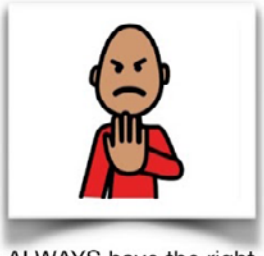
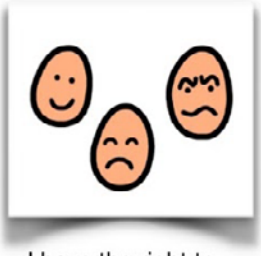
My Communication Bill of Rights

I have the right to my own friends and social life.

I have the right to ask for what and who I want and where to go.



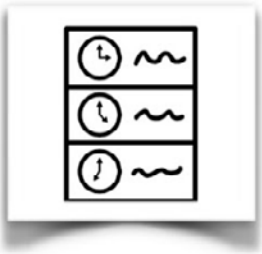
I ALWAYS have the right to say, "no!"



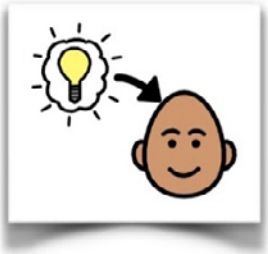
I have the right to say what I feel.

I have the right to make my own, real, choices.

I have the right to say what think.



I have the right to ask for, get and give information.



I have the right to know about the people in my life and everything happening to me.

I have the right to be taught to communicate and have what I need.

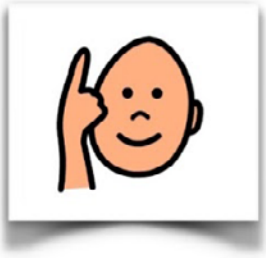
I have the right to have my communication system (and other tools), to have them working and to be with people who know how to set up, use and fix my communication system.

I have the right to be heard and answered, even if I can't have what I want.

I have the right to be part of my community

I have the right to be treated with respect.

I have the right to be talked to and not about.



I have the right with be talked with in a way I understand.

Adapted from the NJC Communication Bill of Rights 2016, ASHA by Kate Ahern, M.S.Ed Mayer-Johnson Communication Symbols Used with Permission

Communication Bill of Rights with Visual Supports from Boardmaker

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THE RIGHT TO BE TREATED WITH DIGNITY AND ADDRESSED WITH RESPECT AND COURTESY

All individuals with disabilities deserve to be treated with respect. No one should ever be talked about in front of them. We should always assume competence.

THE RIGHT TO BE ADDRESSED DIRECTLY AND NOT SPOKEN OR TALKED ABOUT IN THE THIRD PERSON WHILE PRESENT

During remote learning, assuming competence is essential. We must make sure we realize how much individuals with disabilities can do and never try to invoke self-fulling prophecies.

THE RIGHT TO HAVE CLEAR, MEANINGFUL, AND CULTURALLY AND LINGUISTICALLY APPROPRIATE COMMUNICATIONS

All individuals should be celebrated for who they are and learn about their culture and ethnicity.

BUILDING YOUR TOOL BOX

During this time of remote learning, one thing we have learned is that we each need to build our own "toolbox." We need to find tools that will be the most essential to us and the individuals we work with to find their voice and be able to make the choices in their education that they need.

Flipgrid: Flipgrid allows you to share, comment, discuss topics using video and augmented reality (AR). It is a video discussion platform that is free for use continuously. Flipgrid has activities in their disco library that have been premade by teachers for teachers. Flipgrid allows everyone to have a voice. Since you can make a video anytime and anywhere, you can choose where you are most comfortable to share what you want to say. Flipgrid is also great when working out Social-Emotional Problems. It helps individuals share their feelings in a safe environment and let their peers comment back to resolve the issue at hand. Flipgrid also has immersive reader and translation features in it to support a multitude of learners.

Buncee: Buncee is a web-based tool that allows developing multi-media based learning. In Buncee, you can use immersive reader and translation. Individuals can build rooms and activities that are similar to their learning spaces to make them feel more at home.

Kahoot!: Kahoot! is a game-based learning app that allows you to practice skills that you are working towards. Kahoot! has several different question versions based on the level of cost. Kahoot! also allows you to increase the time a question to run to support individuals who need more time. There is also the ability to embed prompts, such as pictures, to assist individuals who may need more help.

Microsoft Programs: Microsoft overs a variety of programs that can be used with individuals with disabilities. Microsoft Excel, Microsoft PowerPoint, Microsoft OneDrive, Microsoft OneNote, Microsoft Teams, Microsoft Translator and Microsoft Whiteboard have supports built into them.

Microsoft also offers Immersive Reader, Office Lens, Dictation, Word Prediction, Translator and Live captions.

Google Programs: Google has developed many programs that can help individuals with disabilities stay organized, focused and continue to complete their work during Remote Learning. Products such as Google Chrome, Google Classroom, Google Docs, Google Drive, Google Jamboard, Google Mail (Gmail), Google Meet, Google Sheets, Google Slides and Google Translate. Google Meet has been a great way for people to remain in contact with one another during remote learning to keep friendships and the emotional bond.

Apple Programs: Apple offers an "Everybody Can Create" program that reviews video, music, drawing and photography to help students learn how to create projects of their own. Apple also offers magnifying, auditory and other visual tools to support individuals with disabilities.

Boardmaker Online: Boardmaker Online provides curriculum as well as interactive activities and visuals for individuals to use. Progress monitoring data can be taken in the program based on the level that is bought. Activities can include developing books, making layouts for static communication devices, sequencing activities, matching, questioning, plus more. Boardmaker Online has recently introduced more pictures that use slang terms for individuals who want to use the same words their peers are using.

Book Creator: Book Creator allows anyone to be an author. You can develop standard-sized books or comic books. Individuals can record their voices and use the read to me feature to have the book read to them. Questions can be embedded in the books to help develop reading comprehension. VIdeos, calculators, Google Maps, FlipGrid, websites, Explain Everything, Adobe Voice, Green Screen by Doink, Popplet sand many more apps can be integrated into this program. Book Creator also has a tool that allows an individual to draw, and the program will try to identify what the drawing is to give it a sharper look.

Wakelet: Wakelet helps you organize materials in one place. For our individuals who need support with executive functioning, Wakelet can be a potent tool in helping them to find and sort content. Wakelet can also be combined with many additional programs. It also has immersive reader, and translation features built-in.

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Thinglink: Thinglink allows you to create unique interactive experiences for students. It allows a document to come to life. Free accounts include: interactive image editing, publish unlimited images, publish unlimited videos, virtual tour creation and 1,000 views per year. Thinglink has opened new doors for individuals with disabilities during remote learning. It has allowed participants the chance to engage in virtual field trips, tour places they will be going to, or usually see, as well as be able to use video modeling to learn how to use their AAC and AT devices.

NearPod: Nearpod allows you to assign and develop student-paced or live lessons. It also allows you to assess students for progress monitoring. Several features enable each individual to share their own personality and how they learn best. These features include draw-it, student Notes, fill-in-the-blanks, polls and race to the top. NearPod is a fun and engaging platform that also encompasses virtual reality for students to get to be able to experience different activities during lessons. Nearpod has immersive reader and translation to support a multitude of learners.

Mood Meter/ Ruler Program: The Mood Meter/ Ruler Program helps individuals with disabilities to share their emotions on how they are feeling. The Mood Meter is essential not only for the individual but for the people working with the individual as remote learning can be difficult, and we need to work on learning to share our emotions positively.

Writing Software: Clicker Software, SnapType, and Widgit Software have all have been programs that have helped support individuals with disabilities. These programs can provide word banks, the ability to type directly onto a worksheet, as well as the ability to use pictures paired with words when writing. AT writing programs will allow individuals to fill in writing webs, sentence starters, as well as help to organize thoughts and ideas.

Communication Applications: Proloquo2Go, TouchChat, Lamp Words for Life, Snap Plus Core, and Podd are all examples of communication apps that are used to support individuals with disabilities when communicating. Various vendors provide these programs at different costs. One of the tenets of the Communications Bill of Rights is that all students should have their communication system. Individuals should always have a back-up plan just in case the device encounters problems.

Kami: Kami is a digital platform that allows you to annotate files. This program is especially helpful during remote learning for individuals who need extra support when writing or using math equations.

Procreate, Microsoft 3D Paint and Art Programs: Art programs are a great way to allow individuals to share their creative talents. Individuals can choose colors, brushes and develop scenes that share what their feelings, thoughts and creative avenues are. Art programs are great at allowing individuals to express themselves in ways people have never thought they could.

Garage Band and Music Program: When you look through someone's playlist, you see what their interests are. Individuals with disabilities should be given the same rights. Individuals should be given the right to develop and choose music that will go along with a project that they are developing on a theme or use instruments to make the music.

AAC Language Lab: AAC Language provides free and paid-for resources Include. These include manual Communication Boards, sample ideas for parents and teachers as well as ideas aligned to a specific curriculum. AAC Language Lab has been a support for many individuals with disabilities in this time of remote learning as they can provide alternatives when AAC devices are not available, and back-ups are needed. Families need to learn how to use an instrument quickly.

PROBLEMS AND TRYING TO FIND SOLUTIONS

One of the most significant lightbulb moments of this time is that we are learning new ways each day make sure that the individuals we are working with have a voice. With the digital divide present, we are becoming innovators in developing content that helps people we support to become more independent and able to share their ideas, thoughts and dreams. The only way to continue to forge this path is as a community working together.

As I am finishing writing this article, I go back to my initial conversation with my husband. How would our lives be different if we had lived in the age of remote learning? How would some of my student's lives be different? To help support our community and share knowledge, I am asking you to share some stories, advice, ideas on our Flipgrid https://flipgrid.com/starkvoice.

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product spotlight

SENSORY GURU – ENABLE BY DESIGN

- Interaction Design – They can help you create interaction concepts to enhance user engagement
- Communication / AAC – They provide a range of concepts and products to help people communicate
- Assistive Technology – From eye gaze to switching, gesture control to speech, they can help meet your AT needs
- Environment Design – Optimising spaces for sensory needs is a core aspect of their design thinking
- Training – They provide training on multi-sensory and communication technology
- Research & Development – They innovate accessible products, experiences and approaches
- Software Development – Bespoke software development services for assistive and sensory apps
- Content Design – Need a game or interactive experience for an event or project, they can help!s.

LEARN MORE

NUEYES INTRODUCES NUCALL A HIPPA COMPLIANT TELEMEDICINE SOFTWARE PLATFORM

HEADWORN ELECTRONIC MAGNIFIER FOR LOW VISION THAT IS EVENLY BALANCED AND COMFORTABLE TO WEAR

Unlike other products that are simply a VR headset smartphone holder, the e2 was designed from the ground up to be evenly balanced on your face for maximum comfort. Because the e2 is a self-contained device, it eliminates the added weight and heat of a smartphone that is simply inside a VR holder. We are the only all-in-one device designed to help the visually impaired with maximum comfort allowing it to be worn for extended periods of time.

3K DISPLAY AND AN HD CAMERA

The NuEyes e2 delivers unparalleled clarity with a 3K display (1440 x 1600 screen resolution at 90hz refresh rate), 101-degree field of view, HD camera with auto focus and QUALCOMM 835 snapdragon processor.

HOW DOES THE NUEYES E2 WORK?

The NuEyes e2 was designed to be a device that not only helps the visually impaired but is extremely easy to use. The only thing you need to do is press the power button and put the device on your head.

Because of its 3K LCD screens you will immediately notice how clear the world becomes. The NuEyes e2 is so simple to use that you control the device with just three buttons. Button one lets you select from a variable magnification depending if you want to read, watch TV, or look at a loved one's face. Depending on your eye condition you use the second button to choose from three different contrast settings. The third and final button is for OCR/text to speech. If your eyes get tired

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from reading or you experience eye strain, let the OCR or Optical Character Recognition read the text to you!

LEARN MORE

Uncle Goose – American Sign Language and Braille Blocks

Uncle Goose American Sign Language Blocks An educational toy for those who want to use American Sign Language to communicate. Touch the two debossed sides on every block of this 28 block set. Use your fingertips to trace the clean, European-style font that accompanies every letter. Feel the attention to detail in every hand crafted cube. This set features our Classic Uncle Goose color palette.

Uncle Goose strategically devoted one sign language symbol to each block. Practice ASL fingerspelling. One debossed side is paired with its font equivalent. They chose a font without serifs to enhance tactile clarity.

- 28 – 1.75 inch cubes
- Made using sustainable Midwestern basswood
- Printed with non-toxic, mouth safe inks
- 100% made in the USA
- Ages 2+

.

Uncle Goose Braille Blocks An educational toy for those who want to learn to use Braille to communicate. Use your fingertips to trace the clean, European-style font that accompanies every Braille letter. Feel the attention to detail in every hand-crafted cube. This set features the Uncle Goose Classic ABC color palette.

Uncle Goose strategically devoted one letter to each block. This means you'll discover the same Braille letter debossed on two sides of every block. One debossed side is paired with its font equivalent. They chose a font without serifs to enhance tactile clarity. The other embossed side is Braille only. These blocks are a pleasure to touch.

- 28 – 1.75 inch cubes
- Made using sustainable Midwestern basswood
- Printed with non-toxic, mouth safe inks
- 100% made in the USA
- Ages 2+

LEARN MORE

Meet NeuroNode: The Most Flexible AAC Solution

Whether you're a caregiver, clinician, or family member of an individual with complex communication needs, they've listened to your struggles and brought you a new solution! The NeuroNode Trilogy is the latest product from Control Bionics for those living with paralysis and loss of speech. Among its many benefits, the NeuroNode Trilogy:

• Provides multiple access methods for flexible use depending on the users day-to-day or minute-to-minute needs

• Increases communication output up to 133% through combined access methods

• Significantly decreases user fatigue making communication accessible all day and night

• Can be funded through Medicare, Medicaid, and Private Insurance.

LEARN MORE

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Talk To Me Technologies – Communication Boards for parks, playgrounds, schools and more!

- TTMT Core + Fringe Communication boards were designed with inclusion in mind, providing easy, convenient access to the most common words used to communicate across multiple settings.
- Created by our team of Speech-Language Pathologists and Vocabulary Design Specialists with 50+ years of combined experience working with AAC.
- Logically categorized by their parts of speech, TTMT Core + Fringe Communication Boards inspire confidence while building skills to engage in conversation and enhance literacy.

POST MOUNT COMMUNICATION BOARD

What's Included?

- Aluminum board with a corrugated plastic core for stability and strength.
- Available sizes: Small (50"x13"), Medium (70"x19"), and Large (90"x24").
- Choice of single- or double-sided.
- Exclusive images from the TTMT Spark™ Symbol Library.
- Your choice of one of 3 board options: Playground, Gym or School.
- Customize up to 10 words/symbols of your choice for an additional price. (Add your own toys, equipment, etc. see link below for more details!)

LEARN MORE

LusioMATE – World's First Wearable Gaming Controller

The problem for almost anyone doing a program of physical therapy is that it can get boring and hard to maintain focus on prescribed goals. How many times have you been given a physical therapy program you didn't do properly?

Their Occupational and Physiotherapists told them they would love a simple tech solution to monitor, motivate and engage clients in order to drive compliance and maximise the likelihood of therapy goals being met.

THE RESULT! The world's first wearable gaming controller, attachable to any part of the body, LusioMATE. LusioMATE connects, via bluetooth, to their LusioHub App which is downloadable to all mobile devices and smart TVs. In the LusioHUB App players can access an ever growing number of fun games created to entertain and motivate them through there physical therapy programs.

LEARN MORE

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Book Creator – Unleash Student Creativity

TBook Creator is a simple tool for creating awesome digital books. Create your own teaching resources or have your students take the reins.

Combine text, images, audio and video to create:

- Interactive stories
- Digital portfolios
- Research journals
- Poetry books
- Science reports
- Instruction manuals
- About me' books
- Comic adventures

LEARN MORE

Pictello – Visual stories that speak for themselves

VISUAL STORIES THAT SPEAK FOR THEMSELVES

Create and share visual social stories and schedules with this app for iOS. Adding your own pictures, videos and recordings to stories you create makes it easier to share information while building literacy skills, as well as confidence in storytelling.

SHARE YOUR WORLD

Social stories, schedules and recounting what you did during the holiday can be much more powerful and fun with visuals and a voiceover. Pictello makes it easy to create a story step by step. It also makes them much more effective by letting you add realistic details like photos, videos, and audio recordings. The Text to Speech voices included in the app are also helpful if you want to use voiceover.

This app is used by people with autism, cerebral palsy, Down syndrome, selective mutism, and other diagnoses.

LEARN MORE

Closing The Gap Solutions Membership

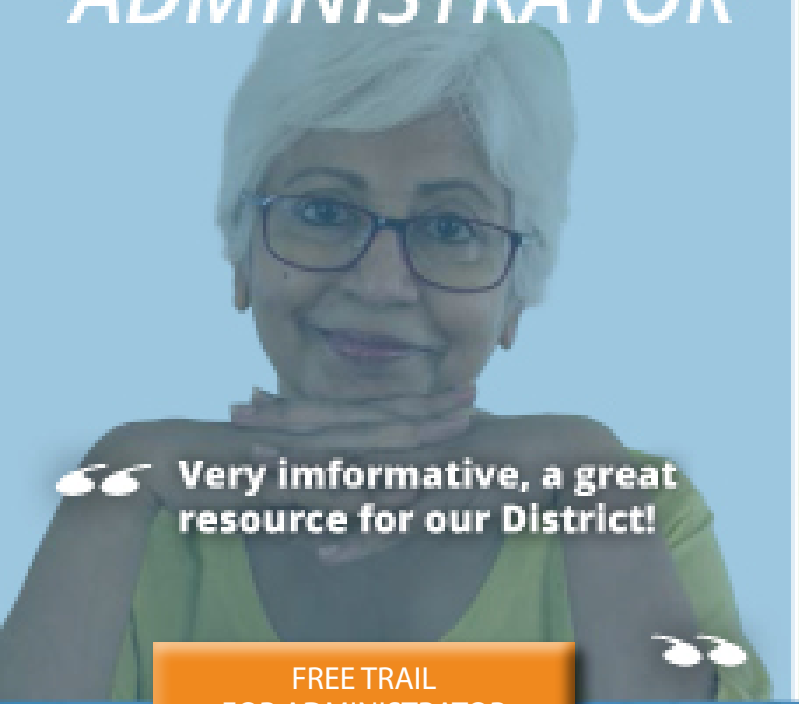
Year-Round Resources, Tools and Training to Support **ALL LEARNERS** *–TRY IT FREE FOR 7 DAYS!*

Deepen your assistive technology knowledge, best practices and implementation strategies.

A FREE Solutions Trial Membership is tailored to your needs, with content specifically segmented and organized for your profession, whether you're an educator, administrator, a specialist or a transition, employment or rehabilitation professional.

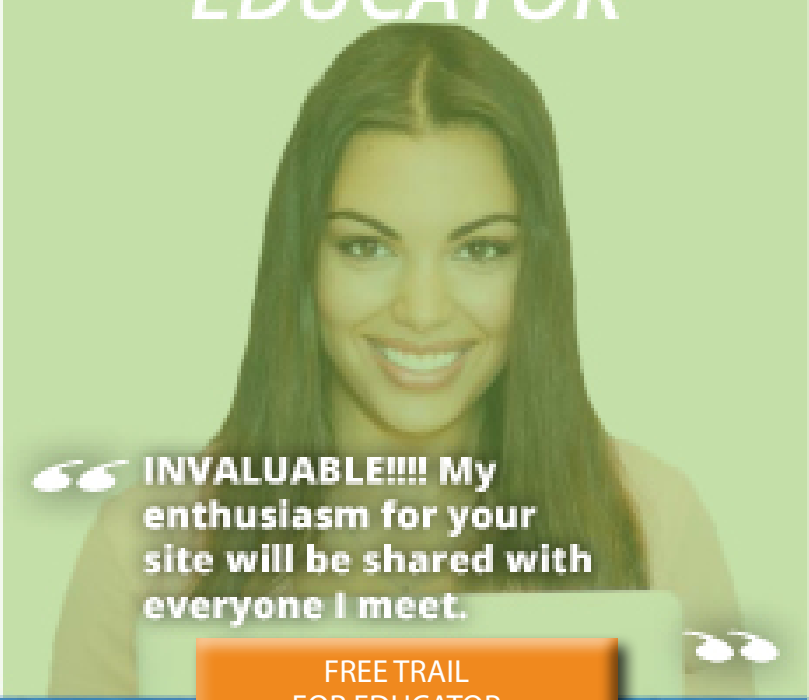
Try it FREE for 7 days. Select a tract that fits your needs for a sampling

ADMINISTRATOR



FREE TRAIL FOR ADMINISTRATOR

EDUCATOR



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Membership will put – you, your team, your district – at the forefront of the latest research, product information, and implementation strategies.

Membership Options and Benefits

STANDARD MEMBERSHIP

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- Six Issues Closing The Gap E-Magazine
- 100+ Archived Webinars On-Demand
- 150+ Contact Hours
- The Acclaimed Resource Directory – A Guide to Over 2,000 AT Products
- $50 Off Standard, 3-Day Conference Registration

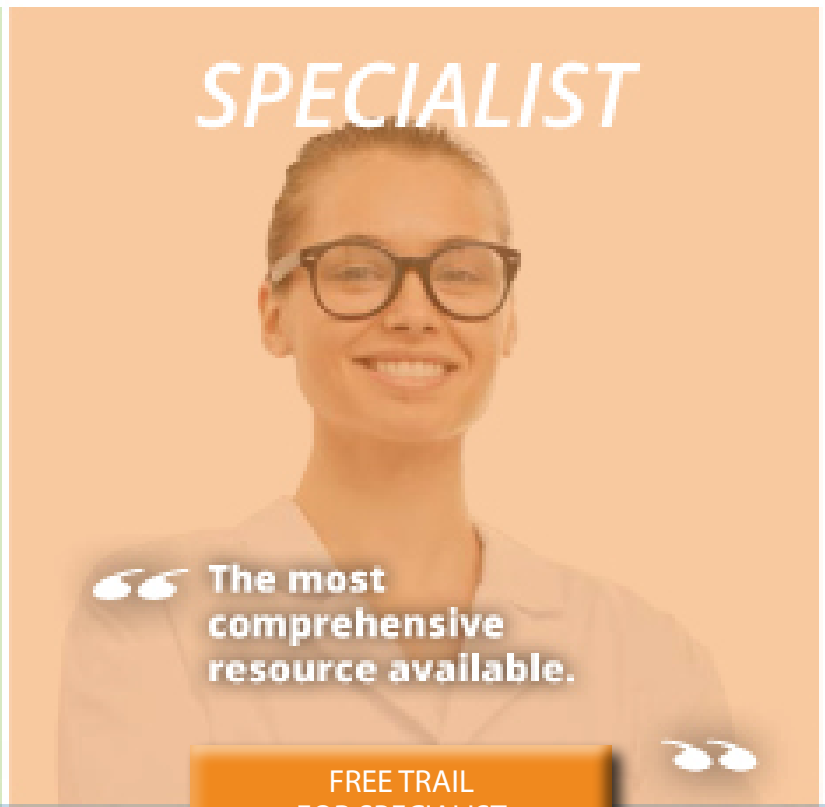
PREMIUM MEMBERSHIP

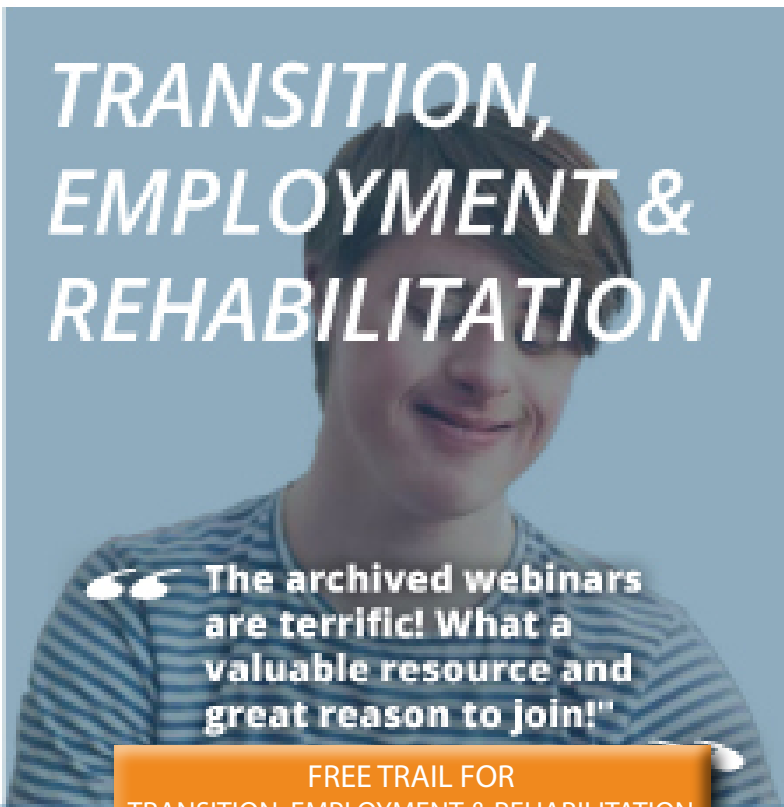
$440 annually

Standard benefits plus ...

- Seat in ALL Upcoming Live Webinars
- Each 90-Minute Live Webinar includes 0.2 CEUs
- $100 Off Standard, 3-Day Conference Registration

of the exceptional resources and training membership offers.





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