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Monitoring/Data - Deena
Trial Goal
LINGUISTIC: Deena will use 2-word phrases to comment, label, and reject during a structured, language-based activity when given a verbal and visual prompt (two core/core + fringe)
OPERATIONAL: Deena will demonstrate the ability to manage simple message window operations (speak, clear, delete) given a delayed model Deena will navigate to logical page/message/vocabulary during a familiar topic or event given 1-2 gestural cues
SOCIAL: Deena will greet familiar people in school and will greet classmates by name with 1-2 visual or gestural cues
STRATEGIC: Requests or obtains the communication device (effectively manages it and transports it safely) given 1-2 gestural cues.

Inclusive Shared Reading Resources and Accessible Books for All

INTRODUCTION

CALL (Communication, Access, Literacy & Learning) Scotland is the national centre for assistive technology in education for Scotland, part funded by Scottish Government and based at the University of Edinburgh. CALL Scotland helps children with additional support needs communicate and access the curriculum through assistive technology. This article shares the background, rationale and resources for a national project undertaken in partnership with Scottish Book Trust.

BACKGROUND

Scottish Book Trust is a national charity, part funded by Scottish Government. Their purpose is to help all children and young people in Scotland develop a love of reading and literacy, and by doing so improve mental health and wellbeing, employment opportunities and close the poverty related attainment gap.

The Scottish Book Trust early years programme, 'Bookbug', supports families with babies and young children to discover the benefits of sharing stories, songs & rhymes. This is done in two ways:

- free story, song and rhyme sessions ('Bookbug Sessions') in libraries and community venues throughout Scotland.
- The provision of four free bags of books as babies, toddlers, 3 year olds and 5 year olds.

Each year during 'Book Week Scotland' one of these bags of books is distributed to the five year olds, the 'P1 Family Bag'. (View Image 1) These bags are gifted to all Primary 1 children in Scotland and the books are linked to the 'Bookbug Picture Book Prize'. The bag contains the three shortlisted books for the prize plus an

Image 1: Bookbug shortlist 2020

activity pack. School children vote for their favourite book from the shortlist of three and the prize is awarded to the winner in the Spring the following year. Every child has access to the books and has the opportunity to participate by voting for their favourite.

CONTEXT & RATIONALE

This 'P1 Family Bag' is distributed to children in their first year of formal schooling within the Scottish education system.

In Scottish schools young people from ages 3-18 follow 'Curriculum for Excellence' (CfE), which is 'intended to help children

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CLAIRE HARRISON qualified as a teacher of Religious, Moral & Philosophical Studies in 1997. She spent over 15 years working with learners who have Complex Needs in schools in London, Fife, Angus and Dundee. Since 2017 she has worked at CALL Scotland in the role of Development Officer for Assistive Technology and Complex Needs.

Image 2: Recorded Narration & Switch Prompt PowerPoint Screenshot.

and young people gain the knowledge, skills and attributes needed for life in the 21st century, including skills for learning, life and work'. [1]

Within 'Curriculum for Excellence' four overarching goals have been identified and they are often referred to as the 'Four Capacities', in the hope that 'Curriculum for Excellence' helps all children to become:

- Successful Learners
- Confident Individuals
- Responsible Citizens
- Effective Contributors

If we consider children and young people with additional support needs and apply these four capacities to the Bookbug Picture Book Prize then we can ask ourselves the following questions:

- How can I be a Successful Learner if I cannot read and understand the words, the narrative and the illustrations because of a learning difficulty?
- How can I be a Confident Individual if I'm depending on someone else to read me the stories, to turn the pages and write about the story for me because of a physical disability?
- How can I be a Responsible Citizen if I don't have access to information in a format I can understand and am unable to take part in voting for my favourite book?
- How can I be an Effective Contributor if I can't speak, write or communicate and am unable to talk about the stories, saying what I liked and disliked?

CALL Scotland working in partnership with Scottish Book Trust have sought to address those questions and remove these barriers by providing accessible books and learning materials for children with additional support needs.

CREATING ACCESSIBLE DIGITAL BOOKS

Since 2009, CALL Scotland have created accessible digital copies of each shortlisted book. The digital copies of the books enable children with a physical difficulty to independently turn the pages and listen to the story being read aloud. There are different digital formats to address different barriers to physically holding a book.

PowerPoint, 'Recorded Narration and Switch Prompt'

The 'Recorded Narration and Switch Prompt' PowerPoints are designed to be used on a computer via an interface box and switch. A hard copy of the book is scanned page by page and the images inserted into a PowerPoint file. A 'turn the page' switch prompt icon and visual and auditory prompt slide is sandwiched between each page of the book. All pages of the book are included along with a copyright notice in order to comply with copyright legislation. (See Image 2)

When the PowerPoint is opened and put into presentation mode the title page of the book is automatically read aloud. The PowerPoint is set up so that there is a 2 or 3 second pause after the title or text is read aloud before the page automatically 'turns' to a switch prompt icon page. Because each of the book page tran-
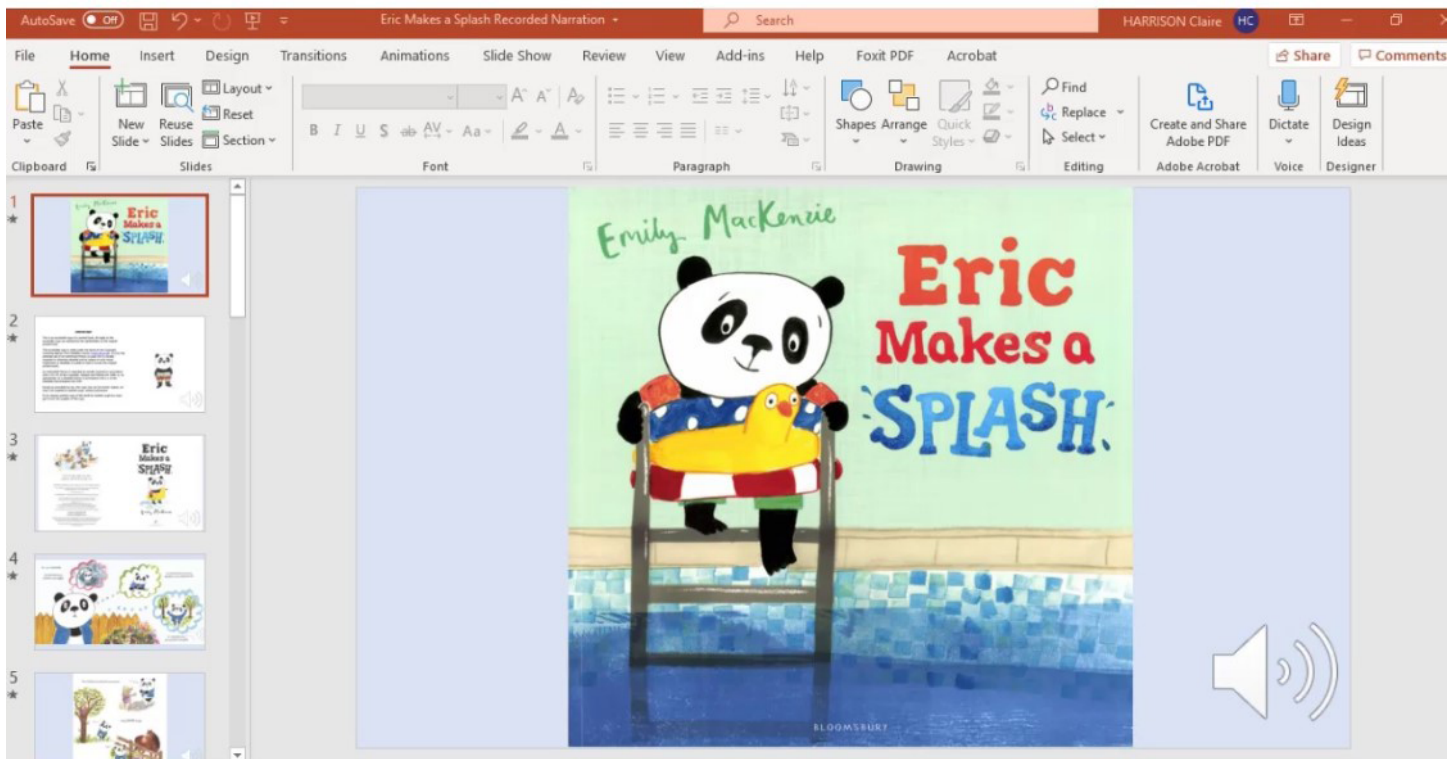
Image 3: Recorded Narration & Navigation PowerPoint Screenshot.

sitions are set to 'Advance Slide: After XXX seconds', provided the switch interface is set to 'Left Click', the reader cannot skip through the pages by accidentally pressing their switch at the incorrect time.

The transitions on the 'switch prompt' icon pages are set to Advance Slide on Mouse Click so that the book will then only advance to the next page when the switch/mouse is pressed. An additional auditory prompt 'ding' sound effect was also added to the 'switch prompt' icon pages to help cue the reader to press their switch to turn the page.

PowerPoint, 'Recorded Narration and Navigation'

The 'Recorded Narration Navigation' PowerPoints do not have the 'Switch Prompt' page sandwiched between the book pages. Instead, each page has a large speaker icon with the corresponding narration. (See Image 3) This enables repetition of the spoken words so the reader can listen to the page multiple times via tapping the icon, using a mouse, rollerball or joystick.

Keynote for iPad

When the use of iPads for communication and curricular support became more popular we began creating additional digital versions of the Bookbug books for the free iOS 'Keynote' app. These Keynote versions work in the same way as the PowerPoint 'Switch Point with Narration' versions - the reader can only turn the page when the switch prompt icon appears on the screen and

the auditory prompt 'dings'. The keynote versions are created by importing the 'Switch Point with Narration' PowerPoints into Keynote and ensuring the transitions between slides mimic the PowerPoint version by editing and adding an 'Automatic' transition to each page of the book, making sure the timed delay is set to take account of the length of audio file plus a couple of seconds.

ACCESS TO BOOKBUG DIGITAL BOOKS

The Bookbug Digital Books are available to download by education professionals in Scotland supporting children who have print disabilities. [2] They are accessed via the CALL Scotland 'Books for All' website. As well as the Bookbug books the 'Books for All' website provides over 2000 books such as textbooks in accessible formats for learners who have print disabilities. More information about the history and rationale of the 'Books for All' project and website can be found here: www.booksforall.org.uk/about/

TIPS FOR CREATING YOUR OWN POWERPOINT & KEYNOTE BOOKS

➜ Whilst PowerPoint allows you to record audio directly into the presentation, use software such as 'Audacity' to create individual '.wav' sound files for each page of the book. This prevents issues with the audio if the book is imported into Keynote on an iPad.

➜ To reduce the size of the final PowerPoint use the 'Optimize Compatibility' and 'Compress Media' wizards found

in the 'Info' menu. Click on File/Info to access this option.

➜ Once the 'Compatibility' and 'Compress Media' wizards have completed save the final PowerPoint book as a 'PowerPoint Show .ppsx' file. Again, this helps to avoid issues with Audio and ensure the PowerPoint book cannot be edited or changed.

ACCESSIBLE SYMBOL RESOURCES FOR SHARED READING.

In 2014 we began creating symbolised resources for each of the Bookbug books to enable learners with additional needs to communicate as they read the story, vote for their favourite book and more effectively engage with shared reading.

We know there is a link between shared reading and the development of language. [3] Research has shown shared reading can develop vocabulary, expressive language skills, and comprehension. [4]

TYPES OF SHARED READING:

Shared Reading where an adult or peer reads a book aloud. Many schools have successful 'buddy' schemes where older children read aloud to their younger peers.

Interactive Reading where an adult reads a book to a child or a group of children and engages them with the text using techniques such as questioning.

Dialogic Reading where the adult and child switch roles. The child is given opportunities to become the storyteller and the adult becomes the active listener and questioner.

The research suggests that dialogic reading can be one of the most effective interventions. [5] Within dialogic reading, where an adult and child have a dialogue about a text, there are a set of specific techniques used to facilitate this dialogue known as 'The PEER Sequence':

Prompt
Evaluate
Expand
Repeat

If we apply this set of prompts to this page from the 'Sophie Johnson: Unicorn Expert' 2020 Bookbug Picture Book Prize shortlisted book, it may look like the following: (See Image 4)

[PROMPT] Pointing to the unicorn in the doorway and asking 'What's this?'

[EVALUATE] Evaluating the response to the 'What's this?' question by replying 'That's right, it's a unicorn'

[EXPAND] Expanding on the child's response by saying 'Yes, Sophie loves Unicorns'.

[REPEAT] Then repeating the prompt, 'What does Sophie love? Sophie loves Unicorns.'

Dialogic Reading also uses different types of prompts to facilitate dialogue around a text - these are known as C.R.O.W.D. prompts.

Image 4: Extract from 'Sophie Johnson: Unicorn Expert', published by Simon & Schuster. Text by Morag Hood, illustrations by Ella Okstad.

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> Then I show them how to hunt for food . . .

Image 5: Extract from 'Sophie Johnson: Unicorn Expert', published by Simon & Schuster. Text by Morag Hood, illustrations by Ella Okstad.

Completion Prompts enable a child to complete a word or phrase, often at the end of a sentence. Completion prompts can help to increase listening comprehension and use of language.

Recall Prompts enable a child to engage with a story by an adult asking questions about a character or an event in the story.

Open-Ended Prompts support children to use language descriptively by asking a child to explain what is happening in a picture.

Wh Prompts which use the 'wh' words such as 'who, what, where', enable a child to name something pointed out on a page.

Distancing Prompts relate the story to something in a child's life, helping to make connections between the story and real life.

Once again, let's apply this to a page of 'Sophie Johnson: Unicorn Expert' C.R.O.W.D: (See Image 5)

[COMPLETION] 'We start with…..magic'.

[RECALL] Pointing at the rubbish on the floor, 'What have Sophies and the toys done?'

[OPEN-ENDED] 'What's happening here?'

[WH] 'Where is the unicorn in this picture?'

[DISTANCING] 'Remember when we played shops with the cuddly toys?'

DIALOGIC READING & CHILDREN WITH ADDITIONAL SUPPORT NEEDS

Is this dialogic shared reading technique effective for children with additional support needs? Karen Erickson & David Copenhavers' research indicates that yes, it is effective, but it is far more effective when it's incorporated with 'Pause Time' - commenting and asking questions using the C.R.O.W.D. prompts plus stopping and waiting and giving the child time to respond. [6]

Many children with additional support needs require additional time to process language, both to understand it and to generate a response. Cognitive load, motor planning (particularly if a child is using a communication aid), hearing loss and sight loss all add to the importance of building in pauses and wait times.

This use of Dialogic Reading techniques with the addition of pauses is something which Karen Ericsson and David Koppenhaver incorporated into their own literacy instruction using the acronym 'Put the CROWD in the CAR':

[COMMENT] You comment, stop and wait.
[ADD] Ask a question, stop and wait.
[RESPOND] Then respond by adding more.

Further information on all aspects of teaching literacy, not just Shared Reading, are available on the Literacy for All Instruction website.

"The focus is on interaction and meaning making. Teachers read with students, not to students. The goal is for the student to lead the interactions during shared reading". (Erickson & Koppenhaver)

SHARED READING RESOURCES: SYMBOLISED COMMUNICATION BOARDS

To enable children with additional support needs to engage with stories, and in this case Bookbug stories, using dialogic reading we created shared reading symbol boards for each of the books. The symbol boards are created for Go Talk 9+'s using 'Matrix Maker Plus' software but they can just as easily become low-tech boards for pointing because they're all PDFs which can be printed off and laminated. The symbols can also be cut up and used on an 'E-TRAN frame' for eye pointing.

Image 6: GoTalk 9+ symbol overlay for 'Sophie Johnson: Unicorn Expert'.

(See Image 6) There is a symbol vocabulary board for each Bookbug story. The three phrases along the top are generally repeated lines, repeated words or phrases which can be said at several points in the story. The remaining vocabulary is a combi-

nation of story specific vocabulary and Core Words which can be used to talk about the story either individually or by joining several words together to create simple sentences. If we take the example of the vocabulary board for 'Sophie Johnson: Unicorn Expert' we have the three repeated phrases: 'What a mess!', 'Oh no!' and 'There he is!'. There are some key characters from the story down the left hand side with other descriptive words and Core Words to the right.

In addition to the symbol overlay for the 'Go Talk 9+' there are also labels for Voice Output Communication devices with single messages to enable learners to engage in dialogue at an early level. Each book has a small and large label for communication devices such as 'BIGmacks' and 'LITTLEmacks'. The single messages are the three repeated vocabulary phrases from the top of the 'GoTalk9+'. There are also general shared reading PDF symbol resources which can be used with any book. The general shared reading vocabulary such as 'turn the page' and 'again' can be useful. These are powerful words in the context of sharing stories and you can engineer the shared reading environment so that the child in charge of the 'turn the page' message is entirely in charge of the pace or lack of pace when you are sharing a book and there is a lot of fun to be had with it!

In addition, there are vocabulary sheets to go with each book to help parents and staff record and use the appropriate vocabulary for each story, and a symbolised teaching activity and vocabulary sheet to go with each story book, adapted from the Scottish Book Trust's Teacher Pack. Children can also communicate their voting choices by saying which book is their favourite using the voting overlays for GoTalk 9+.

All of these low-tech printable PDF symbol resources are available for anyone to download and use from the 'Symbols for All' website.

SHARED READING RESOURCES: SOUNDING BOARD

Sounding Board is an Ablenet app and is free for iPads and iPhones. Sounding Board can be used to create simple communication boards with visual supports and messages which speak aloud.

There is a Sounding Board for each of the Bookbug books using the same symbol vocabulary found in the GoTalk9+ PDFs. The individual Sounding Boards for each book can be downloaded directly from the Symbols for All website and the download link is listed with the PDFs.

SHARED READING RESOURCES: EYE GAZE ACCESSIBLE RESOURCES.

By 2019 CALL were supporting a number of learners who used Eye Gaze devices for communication and access to the curriculum. We wanted to enable them to access the Bookbug books with their devices so we created digital copies using 'Grid 3' software. The 'Grid 3' versions of the books are a combination of the 'Recorded Narration & Switch Prompt' and the 'Recorded Narra-

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tion and Navigation' PowerPoint books. With 'Grid 3' it is possible to have the three repeated phrases on every page of a book so they can be read aloud at any point. There is also a 'listen again' cell similar to the 'Speaker Icon' on the 'Recorded Narration and Navigation' PowerPoints.

These 'Grid 3' version are proving to be helpful for this population of learners, as evidenced by this feedback:

"Having these books available on the eye gaze device has enabled us to enjoy stories together on a whole new level - instead of being a 'passive listener,' L can now play an active role in telling the story including being able to make comments about the pictures and deciding when he is ready to turn the page. He also enjoys the independence of being able to select a book and read it himself when otherwise his physical difficulties would have prohibited him from being able to do so."

As with the PowerPoint books the Grid 3 versions are only available to educators in Scotland via the 'Books for All' website. However, we have created a blank Eye Gaze accessible Grid 3 book for anyone to download:

www.callscotland.org.uk/bit/?XLkypWA

CONCLUSION

The CALL Scotland and Scottish Booktrust catalogue of shared reading resources will no doubt continue to grow as the technology and needs of the learners we support develops. We look forward to creating and sharing these resources as widely as possible!

REFERENCES

[1]   https://education.gov.scot/education-scotland/scottish-education-system/policy-for-scottish-education/policy-drivers/cfe-building-from-the-statement-appendix-incl-btc1-5/what-is-curriculum-for-excellence

[2]   https://www.booksforall.org.uk/home/

[3]   Elliott, Elizabeth & Olliff, Charleen. (2008). Developmentally Appropriate Emergent Literacy Activities for Young Children: Adapting the Early Literacy and Learning Model. Early Childhood Education Journal. 35. 551-556. 10.1007/s10643-007-0232-1.

[4]   Kleek, Stahl & Bauer " On Reading Books to Children: Parents and Teachers", 2009

[5]   Trivette, CM & Dunst, DJ "Relative Effectiveness of Dialogic, Interactive and Shared Reading Interventions", 2007

[6]   http://literacyforallinstruction.ca/shared-reading/ ∎

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PROFFESIONAL DEVELOPMENT

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

Inclusive Learning 365: Part 2 – Virtual Learning and Leading

By Christoper Bugaj, Karen Janoski, Mike Marotta, and Beth Poss
Wednesday, April 7, 2021
3:30 pm – 5:00 pm (Central Daylight Time)

Christopher Bugaj, M.A. CCC-SLP, is a founding member of the Assistive Technology Team for Loudoun County Public Schools. Chris co-hosts the Talking With Tech podcast featuring interviews and conversations about augmentative and alternative communication.

Karen Janowski, M.S. Ed, is an Inclusive and Assistive Technology Consultant and is President and owner of EdTech Solutions, Inc in Reading, MA which provides comprehensive AAC and AT Services in the Greater Boston area.

Mike Marotta, is a RESNA Certified Assistive Technology Professional who has been providing direct services to individuals with all disabilities for almost 30 years. Mike is the 2017 ISTE Inclusive Learning Network Outstanding Educator. Mike is the Director of the Richard West Assistive Technology Advocacy Center at Disability Rights New Jersey, the Federally funded statewide Assistive Technology Act Program.

Beth Poss, M.A. CCC-SLP, M.S. Ed is an educational and technology consultant and former assistant principal. She is currently the Director of Educational Programs for LessonPix.

Part 2: Inclusive Learning for All: Bashing Barriers & Changing Mindsets (Moving Past the "Yeah, but…")

Part of creating a culture of inclusive learning acknowledges there are obstacles to implementation. This session will examine strategies for overcoming real and perceived barriers to inclusive education practices and strategies for creating an inclusive mindset for all stakeholders.

Participants will be provided the opportunity to share real life examples from their work. The presenters will facilitate discussion with reflective questions that participants will answer in smaller groups using a digital tool to share their ideas with the larger group.

Includes 0.2 IACET CEUs, 1.5 ACVREP CEs and/or Closing The Gap Issued Certificates of Contact Hours.

Activities That Put the FUN in AAC Learning: Part 1

By Lauren S. Enders
Thursday, April 22,, 2021
3:30 pm – 5:00 pm (Central Daylight Time)

In this fast-paced first installment of the Activities That Put the FUN in AAC Learning series, participants will learn about common yet powerful and easy-to-use tools and how they can be used to create engaging customized activities to support students who are learning to use AAC.

Information covered will include taking and using screenshots, image and video sources, use of background remover tools, tricks for using YouTube videos, using gifs to encourage language, plus a host of cool digital tools that can be used to create activities that follow a learner's lead!

Attendees will leave with a digital resource that provides links to the tips, tricks, and techniques shared in the webinar. Be sure to check out Parts 2 and 3 for a deeper dive into options for creating custom AAC learning activities as well as ready-made activities that have been shared by creative folks across the web!

Writing Recovery – Closing the Gap with Clicker 8

By Toni Caggiano and Brynn diScipio
Wednesday, April 28, 2021
3:00 pm – 4:00 pm (Central Daylight Time)

How can we help narrow the attainment gap for children who experience barriers to literacy? What strategies can we put in place to close that gap between what children know and what they're actually able to capture in their written work? How can we deal with the fact that, for many, this gap has widened even further during COVID-19?

During this session, we will demonstrate how Clicker 8 will enable you to give

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struggling/reluctant writers the tools they need to work more independently and increase their writing output. We'll explore how to use Clicker's rich data to identify the best next steps for each child's writing progress. And we'll discover how to help students regain their confidence and enjoyment in writing.

Activities That Put the FUN in AAC Learning: Part 2
By Lauren S. Enders
Thursday, May 6, 2021
3:30 pm – 5:00 pm (Central Daylight Time)

In Part 2 of the Activities That Put the FUN in AAC Learning series, participants will learn to harness the power of features within PowerPoint, Google Slides and other "blank slate" style tools (PC, Mac, tablets, Chromebooks) to create engaging customized AAC learning activities.

Demonstrations of how to create custom activities (even on the fly) will be provided. Participants will see how easy it is to import and use photos, web images, AAC system screenshots, and videos to match just about any learner's unique needs. Participants will then learn about the benefits of green screen technology and how it can be used to engage AAC learners. Green screen activities can be surprisingly simple and SO much fun!

Many of the digital tips and tricks learned in Part 1 (using screenshots, removing backgrounds, importing images and videos, etc.) will come in handy while working with the open-ended tools shared in this session. While attending Part 1 is not a prerequisite for this second webinar, attendees might find it helpful to attend both webinars. Be sure to check out Part 3 in this series for a curated collection of ready-made (both free and paid) activities that have been shared by creative folks across the web!

Technology Leadership in Practice: Past, Present, and Future
By Janet Peters and Jon Fila
Thursday, May 20, 2021
3:30 pm – 5:00 pm (Central Daylight Time)

The Center on Inclusive Technology in Education Systems (CITES) believes that effective technology leadership promotes the development of a balanced and inclusive technology infrastructure that examines assistive technology (AT), educational technology (EdTech), and information technology (InfoTech) as part of a technology ecosystem. Inclusive technology systems in school districts directly increase the learning opportunities for students with disabilities, but also provide benefit system wide to all students.

This webinar will highlight effective technology leadership practices that create and maintain inclusive technology ecosystems with the lens of where we have been, where we are, and where would like to go. The session will introduce the CITES Leadership Field Guide that assists districts in establishing such a system. We will specifically guide participates on how to create a collaborative team of diverse stakeholders in the development of a community-wide vision for technology use and create a strategic technology implementation plan.

In this session, participants can expect: 1) an introduction to the CITES Framework 2) a guided walk through of the components of creating an inclusive technology vision and strategic technology implementation plan, and 3) stories and expert advise from a CITES exemplar district. Free tools and templates are included in this session.
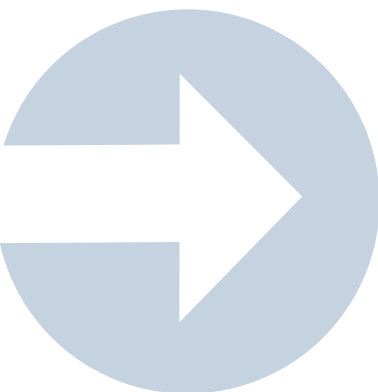
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Training in Evidence-Based Augmentative and Alternative Communication Interventions and Strategies for Adapting to Telepractice

Abstract: Allied professionals serving clients using AAC frequently report limited preparedness to deliver high-quality services. Due to the COVID-19 pandemic, many clinicians transitioned clients from in-person to telepractice services, but limited training in telepractice may have introduced additional barriers to effective service delivery. This article aims to support professionals to deliver high-quality services via telepractice. We review five different AAC interventions with ideas and recommendations for adapting the techniques to telepractice.

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If you are a clinician or an educator who has had difficulty transitioning to telepractice, you are not alone. Though many professionals feel confident in their clinical or teaching skills, it can be challenging for clinicians to translate these abilities to the telepractice environment (Lowman & Covert, 2018). The challenges of delivering high-quality services over telepractice can be even greater when providing services to those who use augmentative and alternative communication (AAC) due to the increased number of tools and training necessary.

Studies have found high satisfaction rates for tele-AAC services (LoPresti, Jinks, & Simpson, 2015), yet there is limited guidance for how to work directly with AAC users over telepractice. The lack of guidance affects all members of the assistive technology team who support AAC users. As a result, all members of the assistive technology team may benefit from coaching to effectively carry out therapy approaches to maximize participation and clinical outcomes for clients who have complex communication needs (Snodgrass & Meadan, 2018; Moorcroft, Scarinci, & Meyer, 2019).

Below are five well-studied interventions traditionally used during in-person sessions. Each section provides a summary of the intervention, overview of a recent study utilizing the technique, and strategies to adapt the techniques to telepractice. While reading about each intervention is a first step, Overby (2018) suggests that only reading or hearing about the interventions may not be sufficient. We actively encourage you to practice each technique and reflect on how these techniques can be applied in telepractice sessions with your individual clients.

MAND-MODEL

A mand-model is a technique typically used to teach requesting behaviors. Gevarter, Horan, and Sigafoos (2020) evaluated the effectiveness of naturalistic interventions, including the mand-model, to teach five preschoolers with Autism Spectrum Disorder (ASD) new vocabulary on two different displays (grid [2x2] and visual scene). When provided with communication temptations, the children used the GoTalk NOW application (Attainment Company) to request access to a desired item. Supports were provided to the children to stimulate a request for a desired item including manding (i.e., the instructor asking, "What do you want?"), modeling (i.e., clinician demonstrating the response on the AAC tool), and physical prompts (i.e., guiding client's finger to the target response). Their study found that using either the grid or visual scene displays resulted in improved requesting compared to baseline.

The keys to their intervention delivery included:
1. Follow the client's lead while restricting access to high-interest objects
2. Play with objects out of reach for 5-10 seconds
   a. Say, "my turn," and take turns with objects of interest
3. Model how to play with items the client is not interacting with
   a. Model how secondary items can be used in combination with interests

4. If no response from the client, provide a mand: "What do you want?"
5. If no response from the client, provide a model on the communication tool
6. If no response from the client, provide a physical prompt to select the desired message

Although the majority of research focuses on mand training, research also demonstrates the benefit of tact-training using high-tech AAC for information sharing (Lorah & Parnell, 2017). The tact is reinforced socially and is used for labeling and naming, whereas the mand is reinforced by the desired object or action and is used for requesting or rejecting.

The intervention structure proposed by Gevarter, Horan, and Sigafoos (2020) can be easily translated for administration in the telepractice environment to teach manding or tacting. First, clinicians must identify an activity of high-interest to their client. A client served by one of the authors of this article had a strong interest in the Spot book series (e.g., "Where is Spot?") which was selected for administration of telepractice via Boom Learning (https://wow.boomlearning.com/deck/7zShhHatWAouH7Exw). The clinician shared their screen to present the activity. The client accessed the session through a Microsoft Surface Pro device and was able to click Spot when provided remote access to the mouse.

The clinician and client took turns searching for and clicking on Spot. After a routine was established, the clinician sabotaged the routine by stopping remote access so the client could no longer click. The clinician prompted, "What do you see?" When the client did not respond, the clinician showed their emulation software on their desktop and modeled how to express, "I see it." When the client did not respond again, the clinician prompted the e-helper (in this case, the client's mother) to use hand-under-hand prompting to redirect the client's hand to their communication device to express, "I see it." The intervention continued in this order, and prompts were faded until the client independently expressed the target phrase.

MISSING/OUT OF REACH & WRONG ITEM FORMAT

The missing/out of reach item intervention occurs when an item for an activity is missing and the client must ask for it (Sigafoos & Mirenda, 2002). For example, a clinician might present all the pieces of Mr. Potato Head except the eyes. This intervention also pairs well with the wrong item format technique in which a client is intentionally provided the wrong item upon a request to tempt the client to reject and clarify the original request (Sigafoos & Mirenda, 2002). For example, in the Mr. Potato Head routine, if the client requested for eyes, the clinician might intentionally provide them with shoes to establish an opportunity to protest and clarify the request.

Choi, O'Reilly, and Lancioni (2010) taught a sequence of request, reject, and re-request to four children with developmen-

tal disabilities. Each child had prior experience with an AAC tool. Their individual AAC tools and preferred activities were used throughout intervention in a classroom setting. To teach requesting, the clinician presented the child with all of the desired objects for a preferred activity except one critical component (e.g., providing a locked box but leaving out the key), and then prompted the child to engage with the activity. Progressive time delay and gestural prompts were used to teach a request (i.e., clinician held the missing item in front of the client and pointed to the relevant message on the AAC tool while asking, "What do you want?"). When a child requested for their preferred activity, the clinician intentionally presented the child with an incorrect item and the child had to express a rejection. If the child did not reject when the wrong item was offered, a progressive time delay and gestural prompt were used (i.e., pointing to "no" on their communication tool and expressing, "Is it what you asked for?" while gradually increasing the time period between when the item was presented and when prompting was provided). The wrong item was then removed, and the clinician waited up to ten seconds. If the child did not re-request, then prompting was provided identical to those expressed to teach the original request. Visual analysis of the results suggested three of four children quickly learned to utilize the targeted requesting and rejecting responses while the fourth participant required an intensive training phase to acquire the skills. Participants also demonstrated the ability to generalize the sequence to non-targeted activities, and some maintained the target skill after four weeks without intervention.

The keys to their intervention included:

1. Present a motivating activity that has multiple items, then remove an important item necessary to complete the activity.
    a. If the client does not request for the missing item, then present the missing item, point to the target message on the client's communication tool, and express, "What do you want?"
    b. Repeat step one while gradually increasing the time between when the activity is presented and when prompts are provided.
2. When a request is made, present the client with a wrong item.
    a. If the client does not reject the item (e.g., express "no"), then hold the wrong item in front of the client, point to the rejecting message on the client's communication tool (i.e., "no") and ask, "Is it what you asked for?"
    b. Repeat step two while gradually increasing the time between when the wrong item is presented and when prompts are provided.
3. When the item is rejected, put the wrong item away, and then wait for the client to again request the correct item.
    a. If the client does not request for the missing item,

then present the missing item, point to the target message on the client's communication tool, and ask, "What do you want?"
    b. Repeat step three while gradually increasing the time between when the wrong item is removed and when prompts are provided.

Adapting the missing/out of reach item and wrong item format techniques to telepractice requires an activity or game with multiple steps or pieces. A client served by one of the authors of this article enjoyed dress-up activities, and Hero Maker from PBS KIDS was an excellent match (https://pbskids.org/xavier/games/hero-maker). The client was skilled at requesting desired items but had not developed skills of rejecting or clarifying a request, so steps two and three of the intervention were selected as target skills to master. When playing Hero Maker, the clinician shared their screen so the client could view the hero's clothing options, **(see image 1)**. When the client requested, "I want green shirt," the clinician intentionally sabotaged the routine by selecting the red shirt. After waiting up to ten seconds, the clinician used their emulation software to scroll their mouse over-and-back on the "no" symbol on Snap + Core First (Tobii-Dynavox) while prompting, "Is it what you asked for?" The client imitated the "no" response and then the red shirt was removed. The client then requested again for the desired item, "I want green shirt." After a few repetitions of this with multiple clothing items, the client quickly learned to protest when the incorrect clothing option was added.

RECASTING

A conversational recast is a response to a client's message where a proficient language user repeats some or all of the client's words while adding new information and maintaining the basic meaning expressed by the client (Cleave, Becker, Curran, Owen Van Horne, & Fey, 2015). For example, if a client using a communication tool expressed, "ball," while playing ball with a family member, the proficient language user might model, "throw the ball," on the tool to recast what the client said to a more linguistically advanced form.

Soto and Clarke (2018) evaluated the effects of conversational recasts on four teenagers with cerebral palsy who used high-tech AAC devices. Participants worked with an interventionist to create a personal collage from teen magazines, websites, personal photographs, and other artifacts to promote conversation. The participant then selected an item to talk about, and the clinician asked an open-ended question to gain additional information about the item. The clinician then used a conversational recast based on the client's message, and then instructed the client to repeat the recast. Ten sequences of question-recast-prompts were delivered in each intervention session. Following the intervention, all participants increased their use of at least one linguistic target.
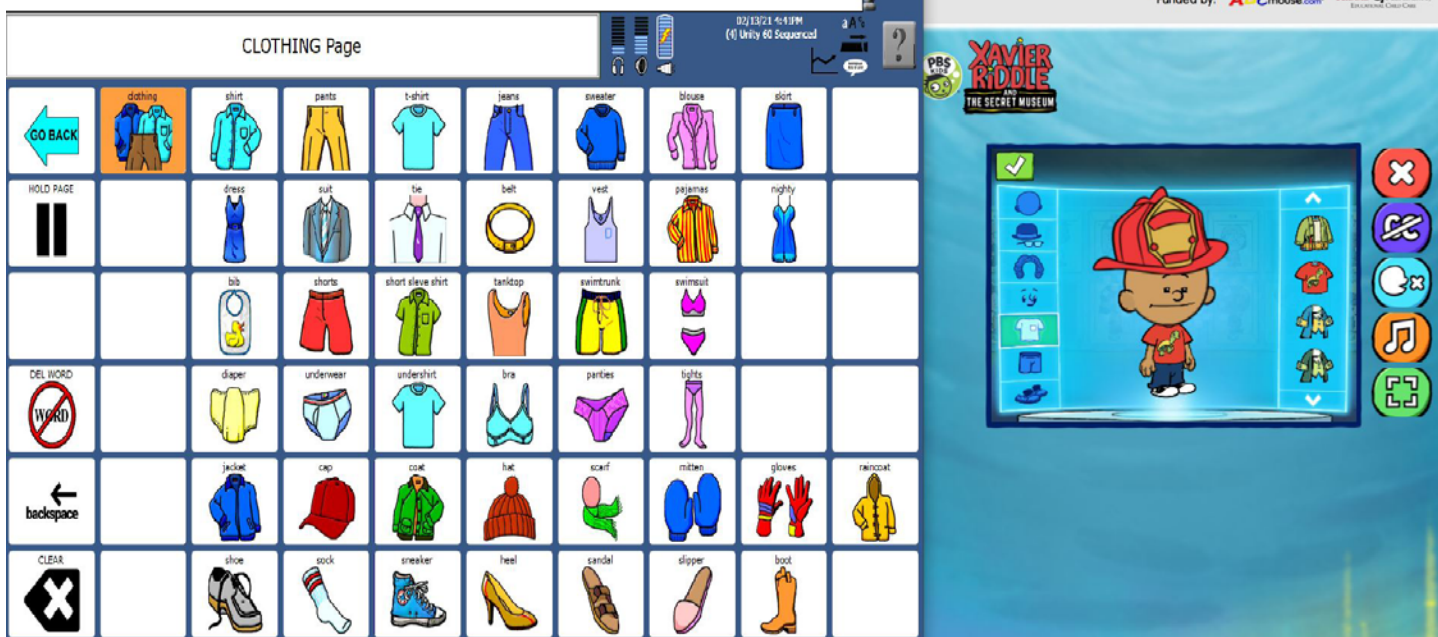
Image 1 - Description: A screenshot of a telepractice administration of the missing/out of reach item and wrong item format interventions. The left half of the screen includes PASS emulation software (Prentke-Romich Company) featuring Unity 60 Sequenced vocabulary file. The text in the message bar contains "I want green shirt. No. I want green." The right half of the screen contains Hero Maker from PBSkids.org. The hero appears to be a child and is dressed in a red shirt, and clothing options are presented at each side of the hero.

The keys to their intervention included:
1. Use a motivating activity such as a shared collage construction task when working with adolescents
2. The client selects a desired item to discuss or add to the collage
3. The clinician asks an open-ended question to gain more information about the selected item (e.g., in response to "flowers," the clinician asks, "What about the flowers?")
4. The clinician then recasts the client's statement (e.g., in response to "flower girl," the clinician recasts, "I was a flower girl")
5. The clinician prompts the client to imitate the recast (e.g., Can you say, "I was a flower girl?")

Adapting this technique and activity to telepractice can be achieved through the use of Google Slides to import static images along with GIF files from Giphy.com. Prior to the session, the clinician created slides containing multiple images and GIFs of scenes or actions. During the session, the clinician shared their screen and prompted the client to tell the clinician when she saw an item that she wanted to add to a collage **(see image 2)** After expressing the item she saw, the item was then copied to a blank slide serving as the collage (e.g., a GIF video of a horse running). The clinician then asked, "Why this picture?" (open-ended question). Using their communication device, the client then ex-

pressed, "I + like + ride + horse." The clinician provided a recast, "I + like + to + ride + horses" and then prompted the client by saying, "Can you say, 'I like to ride horses?'" The client immediately imitated the model and the clinician and client then briefly talked about her interests in riding horses, leading to two additional recast opportunities before selecting a new item for the collage. Following the session, the collage was saved and sent to the client to encourage discussion with friends and family.

AIDED LANGUAGE STIMULATION

Aided language stimulation is an intervention approach in which the clinician points to the aided symbols representing a message as it is spoken. The purpose of the intervention is to provide language input in the same modality that the client is expected to output language; for AAC users, the output language is often aided symbols.

O'Neill, Light, and Pope (2018) conducted a meta-analysis of published work using aided language stimulation. Their study included 26 single-case experimental designs and 2 experimental designs. The studies featured a variety of participants including people with intellectual disability, ASD, Down syndrome, cerebral palsy, childhood apraxia of speech, and developmental disabilities. Interventions which included aided language stimulation were found to be highly effective to support comprehension and expression across participants of various ages, disabili-
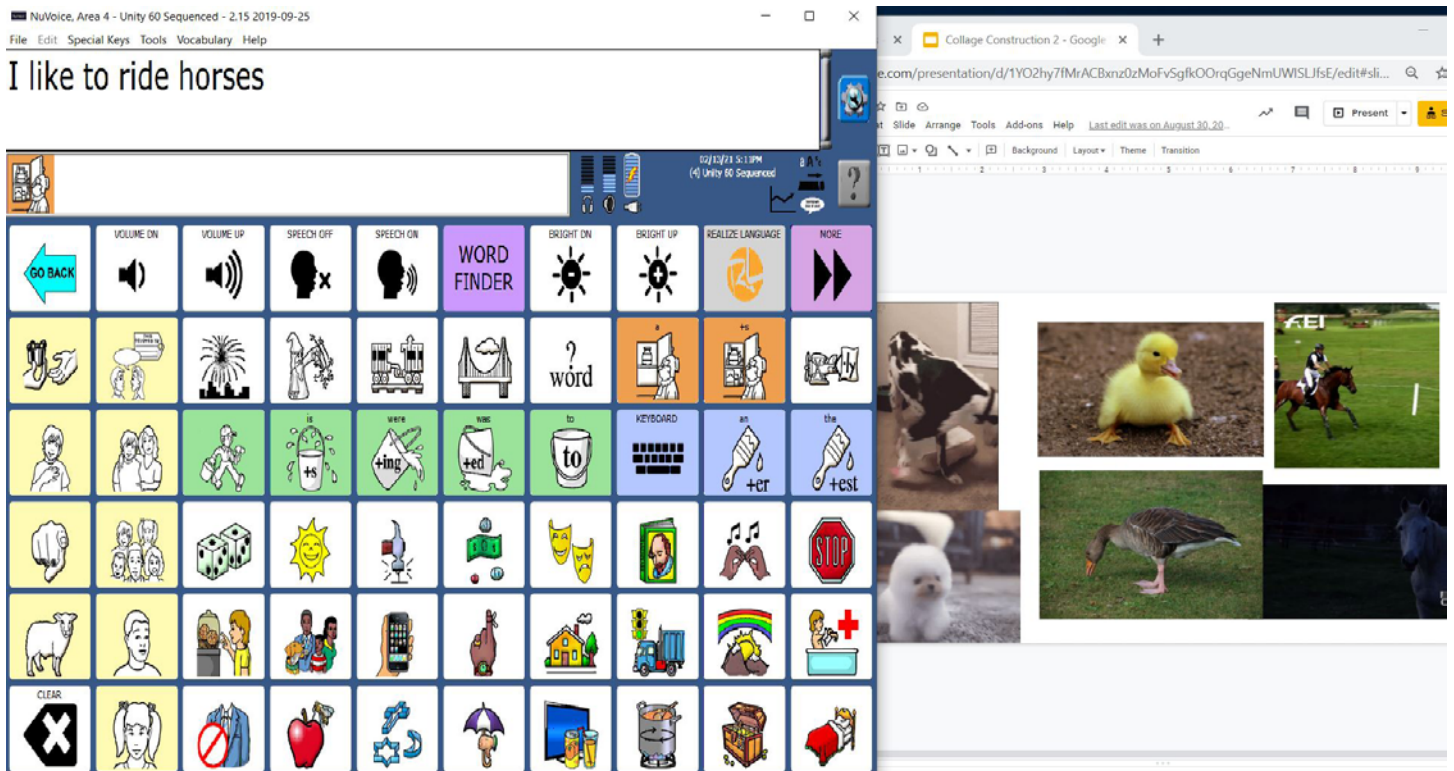
Image 2 - Description: A screenshot of a telepractice administration of the recasting intervention. The left half of the screen includes PASS emulation software (Prentke-Romich Company) with Unity 60 Sequenced vocabulary file. The text in the message bar contains "I like to ride horses." The right half of the screen contains a Google Slide with six images including dogs, ducks, and horses.

ties, and language skills.

Although studies of aided language stimulation vary in dosage (Brock & Allen, 2017), Reichle and Drager (2010) advocate that aided language stimulation should be delivered in at least 70-80% of all spoken communication. Below are recommended tips for effective delivery of this intervention:

1. Point to the aided symbol referent for a minimum of 70-80% of all spoken words.
2. Point to the aided symbol within one-to-two seconds of speaking the word so the spoken and aided word forms are time-locked.
3. Do not prompt the client to imitate your message. The goal is to talk to the client while they observe you using their same language modality.

Providing aided language stimulation in telepractice may require additional software or tools. For clients who use high-tech AAC tools, professionals should feel encouraged to consider downloading emulation software mirroring the same vocabulary that the client uses. Clinicians working with clients using programs such as LAMP Words for Life, Unity, Empower, Snap + Core First, TouchChat, or NovaChat can find free downloads of the emulation software available from the developer's website. Emulation software is typically free to professionals working with clients, though the emulation software may not have all features available, such as voice output.

For clients who are using high-tech AAC devices that are unlocked (i.e., have access to the internet and other device functions), it may be possible for the client to connect directly to your telepractice session through their device. Once in the telepractice meeting, either the client or the e-helper may assist in screen sharing the device and providing the clinician with remote access control. This can allow the clinician to control the cursor on the client's device and provide aided language stimulation. These authors urge any clinician considering this method to seek the expressed permission of the client to use their communication device in such a way.

Clinicians may also consider light-tech solutions by using printed versions of the communication tools. By using external web cameras or document cameras pointing to the printed communication tools, clinicians can directly point to symbols to provide interventions. For example, clinicians can attach a webcam to a paint-stick positioned above an activity board so they may provide aided language stimulation.

Once the mode of administration is selected, the intervention can be delivered in any activity that is of interest to the client. For a client who enjoys camping with her family, a clinician-led activity may include online shopping for camping supplies. While screen sharing, the clinician searches for camping supplies on Amazon.com on one half of their screen and presents emulation software on the other half of their screen (mirroring the same vocabulary file used by the client) (see image 3). While search-
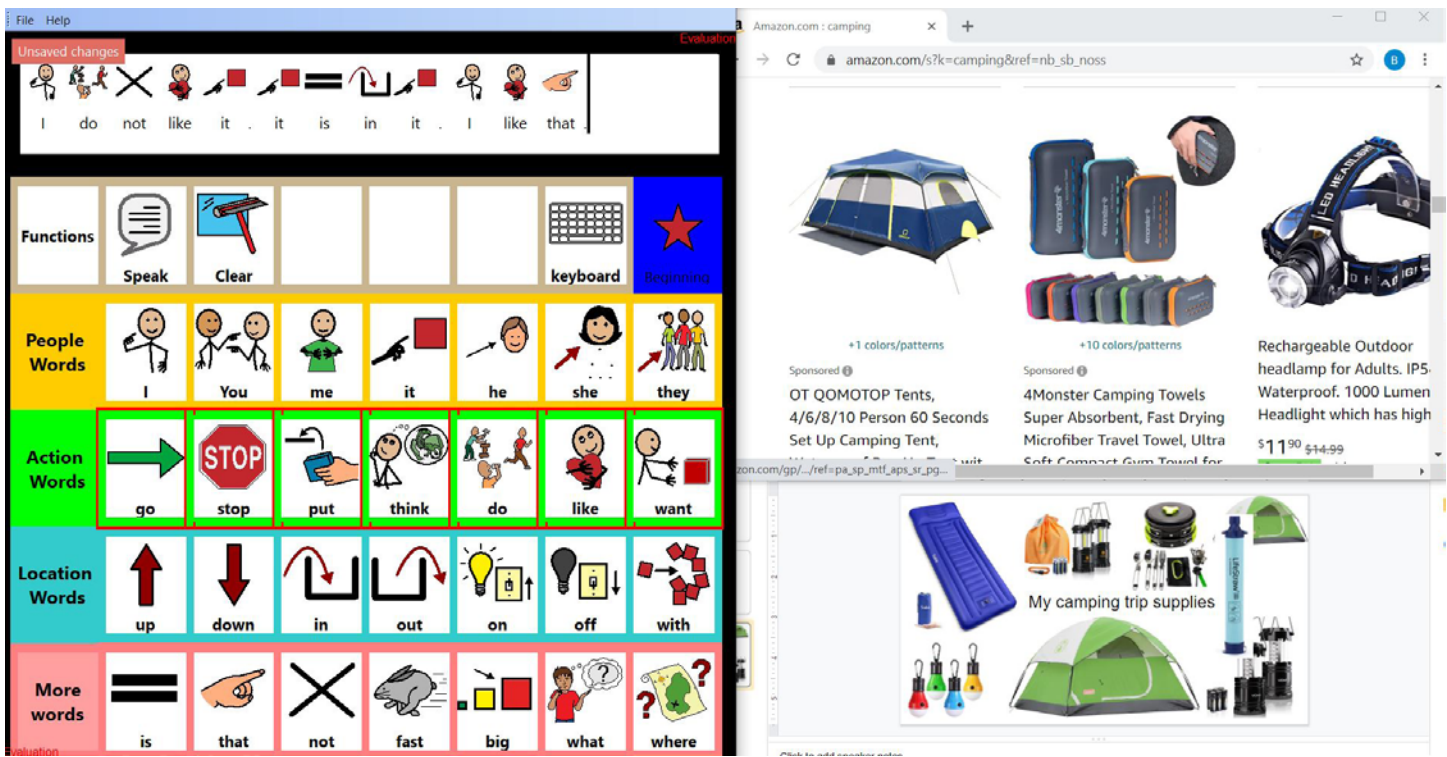
Image 3 - Description: A screenshot of a telepractice administration of the aided language stimulation intervention. The left half of the screen includes Communicator 5 software (Tobii-Dynavox) with a custom core board. The text in the message bar contains "I do not like it. It is in it. I like that." The top-right half of the screen contains camping items viewed on Amazon.com. The bottom-right half of the screen contains a Google Slide with the text "My camping trip supplies" at center. Images of camping supplies are pasted around the text on the slide.

ing through items, the clinician provides simultaneously spoken and aided models of "I do not like it," "I think it is big," "I put it in [the shopping cart]," "We [are] go[ing] fast," "What do we want?" "It is next to it [the tent]." Once an item is selected, the picture of the item is copied into Google Slides for a complete list of all of the camping trip supplies, and URLs for each item are linked to each image to quickly access them again. Throughout the ten-minute activity, the clinician never prompts the client to imitate them, and they provide aided language input in at least 80% of opportunities.

INVERTED YES/NO QUESTIONS

The use of inverted yes/no questions refers to the reversed position of a sentence subject and to be verbs to create a question (e.g., Is SpongeBob singing?) or statement (SpongeBob is singing). Teaching inverted word order may have distinct advantages for AAC users who may rely on word order to express question forms rather than relying on intonation that may not be adequately expressed by AAC tools (Kent-Walsh, Binger, & Buchanan 2015).

Kent-Walsh, Binger, and Buchanan (2015) evaluated participants' ability to develop expressive use of yes/no question forms and statements given aided language modeling and presenting contrastive use of to be verbs as auxiliary verbs or copulas. Three children who used high-tech AAC tools participated in their study and were tasked with labeling or asking questions about

actions performed with toys. During each intervention session, clinicians began with an aided language stimulation phase. In this phase, the caregiver covered their eyes while the clinician sat with the child and provided aided language stimulation regarding an action of a toy (e.g., Jessie is laughing). The caregiver then uncovered their eyes and then asked the interventionist the question form (e.g., Is Jessie laughing?). Twenty statements and questions were administered during the aided language stimulation phase. Following this phase, the clinician then played with the child for 25 minutes. During play, the clinician followed the child's lead and delivered prompts to elicit target responses. Prompts included use of expectant delay, open-ended questions (e.g., "What is Mickey doing?"), direct verbal prompts (e.g., "You tell me"), and gestural prompts. During each session, the child achieved a minimum of five attempts at either target. Messages were imitated by the clinician or recast if an error was produced.

All three children mastered the ability to utilize the inverted position of to be verbs to make statements and questions during probe sessions. After mastering use of the inversion in the context of main verbs (e.g., Woody is singing), all three participants were able to generalize to the use of adjectives (e.g., Jessie is happy; Is Jessie happy?). The children also maintained use of inverted to be verbs and the use of adjectives to varying extents.

The keys to their intervention included:

1. Begin by providing twenty total aided language models of declarative statements (SUBJECT is VERBING) and questions (Is SUBJECT VERBING?) in a high interest play context
   a. Refer to aided language stimulation section for guidance on administration
2. Invite the client into play. Follow the client's lead and use naturalistic intervention techniques to elicit responses.
   a. Provide the client a minimum of five attempts at each skill (five declarative statements and five questions)
   b. Recast client productions as needed (refer to recasting section above for guidance)
3. Once the client demonstrates mastery of these skills, generalize the skill to adjectives (SUBJECT is ADJECTIVE; Is SUBJECT ADJECTIVE?)
   a. Provide the client a minimum of five attempts at each skill (five declarative statements and five questions)
   b. Recast client productions as needed (refer to recasting section above for guidance)

Administering this technique over telepractice should begin with selecting a high interest activity. One of the clients served by an author on this article was a fan of SpongeBob SquarePants (Nickelodeon). Utilizing Google Slides and Giphy.com, the treating clinician generated a set of slides where SpongeBob was hosting a party for his friends. An invitation list was created so the client knew the order in which SpongeBob's friends were arriving. A GIF file was imported to a slide which showed someone knocking on SpongeBob's front door. While showing the emulation software on their computer, the clinician asked, "Is Squidward knocking?" and then advanced the slide to a GIF of Squidward playing an instrument in the open front door **(see image 4).** The e-helper, in this case the client's mother, responded on the client's AAC tool, "Squidward is knocking!" The slide advanced to the invitation list, now with an "X" through the image of Squidward so the client could predict who was next to arrive. The slide was advanced, and another image of someone knocking on SpongeBob's front door was presented. After this routine had been established, the task was exchanged so the client would ask the question. The clinician advanced the slide to an animated GIF file of someone knocking on SpongeBob's door and used an expectant time delay. The client's mother then used their AAC tool to express, "Is Pearl knocking?" The slide was then advanced, and the clinician excitedly exclaimed, "Pearl is knocking!" while providing aided language input. This routine was continued for nine additional characters.

After the aided language stimulation phase, the clinician then said, "SpongeBob is giving food to his friends." A list was created so the client knew the order in which SpongeBob's friends would eat. A static image was imported to a slide which showed SpongeBob holding a Krabby Patty. While showing the

emulation software on their computer, the clinician asked, "Is Sandy eating?" and then advanced the slide to a GIF of Sandy eating food. The client expressed "yes" to which the clinician redirected for the target phrase by asking an open-ended question, "What do you see?" The client then successfully expressed, "Sandy is eating." The slide then advanced to the "eating list," now with an "X" through the image of Sandy so the client could predict who was next. After this routine had been established, the task was exchanged so the client would ask the question. The clinician advanced the slide of SpongeBob holding a Krabby Patty, and the clinician then used an expectant time delay. After no response from the client (who had become familiar with waiting for the clinician to ask a question), the clinician provided an open-ended question (e.g., What is next?). After still not receiving a response, the clinician expressed, "Tell me 'Is Patrick eating?'" A response was still not received, so the clinician demonstrated the question on their emulation software, which was followed by the client imitating the message. The slide was then advanced, and the clinician excitedly exclaimed, "Patrick is eating!" while providing aided language input. This routine was continued with progressively reduced prompting.

CONCLUSIONS

Despite some of the differences between in-person and telepractice services, effective administration of language interventions is still possible in the telepractice environment. Planning effective telepractice treatments for AAC users may take longer than our in-person sessions, yet the infinite resources available on the internet provide us new and creative ways to meet the needs of our clients.

While we have presented multiple ideas for adapting intervention techniques for telepractice administration, it is critical that professionals keep in mind that limited evidence exists regarding the efficacy of these intervention techniques administered via telepractice. The American Speech-Language-Hearing Association (n.d.) suggests that evidenced-based practice is not only external evidence collected from research articles. While research studies should serve as a foundation for decisions clinicians make, internal evidence, or the data and observations collected during sessions, should also be used to drive clinical decision making. If you plan to employ these techniques during your sessions, careful data collection is necessary to ensure your clients are making progress towards their treatment goals. If progress is not observed, then a change in administration, intervention strategies, or treatment plan may be necessary. Further, evidence (external and internal) is only one aspect of evidence-based practice, as client perspectives and your own clinical expertise are equally important variables in the decision-making process.
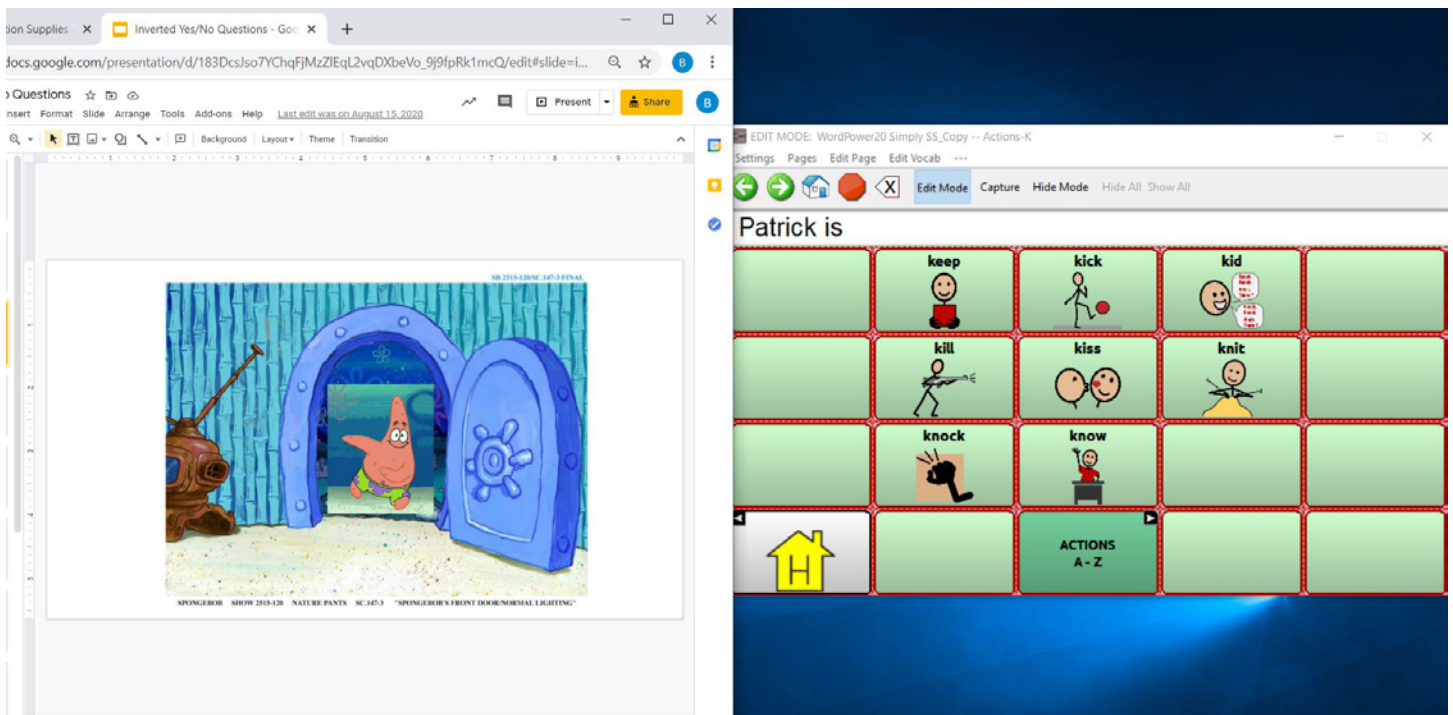
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Image 4 - Description: A screenshot of a telepractice administration of the inverted yes-no questions intervention. The left half of the screen contains a Google Slide with an animated GIF image of Patrick from SpongeBob SquarePants (Nickelodeon) in the doorway of SpongeBob's house. The right half of the screen has the Chat Editor emulation software (Saltillo) with Word-Power 20 vocabulary file. The text in the message bar contains "Patrick is." The current page features 20 boxes, nine of which have actions words beginning with "k".

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A Team-Based Consult Model for AAC Services: Engaged Teams, Increased Device Usage

"Please ask me for help! Let me know what I can do to help your students!"

Do you say that? Do you mean it? While many assistive technology professionals are stretched thin, I have frequently asked my teams and families what I can do for them - volunteering for more work. I do this because I have found proactively asking to help and subsequently providing the additional support has helped individuals engage with communication devices and increase utilization of these devices. Finding time for this can be a challenge; however, our process for providing students with communication devices is efficient, effective and supportive of me working alongside our staff who help our students use their communication devices.

This article provides a brief insight into four extra things that an assistive technology (AT) professional can do to help support students who use communication devices and the SETT (Student, Environment, Task, and Tools) process. Critically, this process allows AT professionals to have the time to provide these additional services. Of note, our process was guided by Joy Zabala's work on the SETT framework. (http://joyzabala.com/)

SUPPORTING STUDENTS WHO USE AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC)

There are four ways in which I provide support to students who use AAC: I provide beginning-of-the-year training for students' educational teams; facilitate a bi-monthly social group;

make a point to model in the classrooms; and model and answer questions in the hallway.

In the beginning of each school year, I offer individualized or small group training to new staff members, including teachers, program assistants (PAs), and therapists. I also offer this training to staff members when students move to a new classroom. In this training I share the SETT documents created by the previous team documenting why a student has a communication device, why a specific device was chosen, and the student's abilities. It is important that staff members understand what was chosen and why. This increases motivation to use a device with a student. Additionally, instead of me insisting that a device is needed, the staff member can connect with the reports from their peers teacher-to-teacher or therapist-to-therapist. Once we have common ground on why the device is in place, staff members have an opportunity to practice using a copy of their student's (or students') device(s). Helping a staff member learn to navigate the device and find words that are meaningful to them is fundamental to device integration. As staff members learn the vocabulary files, most become empowered to use their new knowledge. With motivation to use the device and an understanding of how vocabulary is organized, we problem solve on how to integrate the communication device into their routines and activities.

In addition to working with staff members, I work directly with students in several different venues. I facilitate a social

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group twice a month for all our high school students who use communication devices. Our students enjoy leaving class to come to our boardroom and interacting with their peers from different classes. This is especially important for students who are the only student in their class with a communication device. The classroom speech-language pathologists (SLPs) who work directly with these students on a weekly basis also come to help; having three to five SLPs in one room to provide support increases what we can demonstrate and facilitate. Social group begins with projecting students' communication devices and modeling how to ask and answer a specific question. Initially, we work on personal information and then we focus on asking and answering getting-to-know-you questions, such as "What do you like to play?" and "What is your favorite TV show?" After students practice as a whole group, we break into pairs for students to talk to each other. Sometimes the SLPs pick the pairs, sometimes students have the opportunity to request a specific partner. This is highly motivating for students, and we see so much communication and initiation!

On going support for staff members and students who use communication devices continues throughout the school year both inside and outside of the classroom. I drop into classrooms where I model on students' communication devices. If I need to come into a classroom to fix a device or help with programming, I provide aided language input (modeling) to our students. Additionally, I have identified times that are helpful for different classrooms to have an extra person to help, and teachers are usually happy to see me. I have had success by providing modeling support during other therapists' whole group lessons, when part of the staff team takes a lunch break, during circle time, and more. Part of being a good team member means listening, and I try to listen to what would help.

I am in the classroom for an average of 15 minutes, and the majority of that time is spent

hands-on with the students' communication devices. My goal is to enter all our classrooms with communication devices at least once a month. This varies depending on the other demands of my schedule.

Staff members are also proactive in seeking my assistance, and I am frequently asked questions in the hallway. Hallway Help has become an integral part of the support I provide. Staff members (teacher, PAs, occupational therapist, physical therapists, and SLPs) will ask me on the fly where words are located, to update names or ages in a student's communication device, or to fix a device. Sometimes they just update me on a student's progress. I really enjoy hearing what a student said that morning during story time or how many times a student said they were all done/finished. Taking the time to provide encouragement, answer questions, or schedule a time to provide more support has helped to keep staff members and students motivated and knowledgeable on using communication devices. After addressing the adults present, I also take time to model on students'

communication devices. We talk about what they

had for lunch, how they are feeling, where they are going, what they did that morning, and more. I am grateful for these 5 minute (or more) conversations and find that these positive interactions build a community supportive of AAC.

Whew! There is a lot that I am doing in addition to starting new students on AAC. How am I able to keep this up? I have extremely supportive administrators who have tweaked my schedule year after year to increase the time I have available to provide support. Additionally, our structure for starting new students on communication devices enables empowerment of treating teams. This structure also streamlines my time, allowing me to spend time providing the services just described.

STARTING NEW STUDENTS ON AAC THROUGH TEAM-BASED PROBLEM SOLVING

Our process to help students begin using AAC can be broken down into six steps, and begins and ends with team communication and collaboration.

FIRST STEP: TEAM COMMUNICATION

When a member of a student's treating team believes that a student would benefit from AAC, before I, as our Assistive Technology (AT) SLP, will proceed, that team member must discuss the possibility of AAC with their team, including the teacher, case manager, other therapists, principal, and parents. Only with everyone agreeing to consider AAC will our process move forward.

SECOND STEP: COMMUNICATION WITH THE ASSISTIVE TECHNOLOGY SPECIALIST

Once the whole team is supportive of considering assistive technology, I collect critical information by sending the team three forms to fill out. Excitingly, these forms are now Google Forms and can be filled out electronically. Once submitted, Form Mule, a Google sheets add-on, sends neatly formatted emails with the information. These forms take about 5 minutes each to complete.

Staff members fill out the Student Information Guide to provide basic information regarding the student's personal information and team members' contact information. Submitting this form also generates an automatic email to building administrators and case managers to make sure they are aware that a student is beginning the SETT process. We use principals' and case managers' emailed responses to confirm their support.

The special education teacher and speech-language pathologist then each fill out a separate form with questions detailing the student's ability. The Teacher Addendum and Speech Addendum ask open-ended and criterion-referenced (checkbox) questions regarding the student's receptive and expressive language, including looking for strengths and weaknesses. Staff members also document what strategies and materials they have tried to

help the student communicate. In addition to providing the AT SLP with insight, this helps prepare the team members to share at the SETT Meeting.

The Teacher Addendum also includes a question on the best time to observe the student in the classroom. With this information, I schedule an observation.

THIRD STEP: MEET THE TEAM AND THE STUDENT

Entering the classroom, I begin to observe the environment, taking care to note visuals, staff, and other supports in place to help this student. I am looking for how the student is able to communicate and when communication breaks down. I am listening to the staff regarding the student's progress in other areas, medical changes, and interests. Most of our classrooms are familiar to me, and the staff are my friends. This helps the observation to be low-key and enables everyone to be open about what successes have occurred and what challenges they are facing. Despite already having a relationship with the team, I still make a point to do a formal observation to focus on the student. This helps me to have a clearer picture of where we are starting as our SETT process continues.

During this observation, I may show the student devices or other visuals to see how he or she responds. Our classroom SLPs have iPads with access to communication apps and AAC Genie. This has really increased our ability to accurately identify students who would benefit from a communication device. If available, AAC Genie information is used during our SETT meeting; however, it is not required as part of our process. Many of our preschool students with autism are unable to complete AAC Genie, and we use their classroom exposure to AAC to help guide our decision regarding grid sizes.

FOURTH STEP: SETT MEETING

With support from the treating team and parents, and with observations of the student completed, we schedule a SETT Meeting at a time that everyone can attend. We have been creative with our scheduling, as these meetings do NOT occur if parents are unable to attend.

After introductions, the SETT Meeting begins with individuals sharing strengths of the student, such as "the student has strong communication intent as demonstrated by his frequent use of gestures." Different members of the team share strengths about communication and relevant information in their area; for example, our occupational therapist might share that a student has good finger isolation and is able to point to a small picture.

From there we discuss where a student will be communicating, as the environment impacts the tools needed to communicate. This is very important as we consider different carrying options and vocabulary.

Next, we discuss the task of communication and how communication breaks down. For example, "the student is limited by pointing to objects in the room and becomes frustrated when

unable to show you what he wants."

All of this occurs prior to a discussion about tools, and has proven helpful because everyone is on the same page prior to discussing technology. This is a guided conversation with everyone sharing their thoughts and experiences with the student. I will frequently call on different members of the team to ensure that everyone has a chance to talk.

Two examples of the first half of SETT Meeting notes can be seen in **Image 1**. The collaboration of these teams during the SETT Meetings helped shape what tools we evaluated during the second half of each SETT Meeting.

Our discussion on tools began with looking at tools that had been tried with the student in the past. Team members shared what had worked with these different tools, and why these tools were no longer meeting a student's needs. We want to learn from what has been done in the past and use this insight into the student to help guide our next communication tool.

Our last discussion prior to evaluating specific tools is to discuss what features would benefit this student in their next communication tool. Do they need voice output, a robust vocabulary, an ability to create sentences quickly, a high contrast screen? I will help team members identify features that reflect the conversation we've been having regarding the student, the environment, and the breakdowns in the task of communication. One teacher in particular was extremely hesitant and almost resistant to a communication device. As we discussed her concerns, it became clear that she was primarily concerned about grid size and ease of access.

Once we have a list of needed features, I show multiple communication tools. I believe that it is important to always show teams more than one option. I highlight how a specific tool has or is lacking in the features we just discussed. Teams have often learned a lot about what they want by seeing something that doesn't appear to be a good fit for their student. When in person, we pass these device options around for teachers, parents, and therapists to try them out for themselves. During remote meetings, I still share the different options, and when possible I give remote control to the team members. For my teacher who was concerned about grid sizes, I made a point of showing how different programs could be adjusted, and we spent time looking at navigation. To be included in the conversation and have her voice heard made such a difference for this teacher. She proceeded to do an excellent job of integrating the communication device we chose.

After everyone has had a chance to look at the options and ask questions, we make a decision as a team on which tool we will try with the student. I end this portion of the meeting by going around the table to each person on the team and asking them if they agree with the decision to start with this tool. This has led to productive conversations and ownership from each team member in the decision. We have typically achieved unison among our team members, or at least a willingness to try

STUDENT - Deena	ENVIRONTMENT	TASK
• SLP reports that Deena attempts to imitate and can use a few different vowel sounds but is missing many consonant sounds. Deena uses jargon, pointing, and moves people around the environment to communicate. • OT reports that Deena has good fine motor skills and good play ski9lls; this should support direct access. • PT reports that Deena's balance and coordination should be sufficient to transport a device, but she often bumps intothings in the classroom. Should have a tough case and carrying strap. • Teacher reports that Deena is happy to be at school, is social, and wants to communicate with others and have them communicate with her. Deena hollers out "ma" or "mama" to get the attention of others. She is very motivated anbd interested in learing and being 9involved in the classroom. • Mom reports that when she is promted and given a model she will say "pa" / "papa" and "ma" / "mama". She is try8ing to get her to i9mitate but it's difficult for Deena. • Deena understands most things and can follow directions.	• Self-Contained special education room-Deena's class in Early Chldhood • Deena has had access to an iPad with TouchChat with Word Power in the classroom and has been very receptive to learning and using it. • Mom reports that at home Deena Calls out and will move people around the environment to communicate with her wants/needs. • Other places that Deena visits and needs to communicate in are: 2 paternal aunts houses	• Deena has difficulty expressing her thoughts and ideas.

STUDENT - Hiro	ENVIRONTMENT	TASK
• Mom reports Hiro is following 1-step directions at home (get my jacket, find my keys). He is persistent in communications at home. • SLP reports that Hiro has a good sense of humor and wants to be involved. He answers yes/no questions (claps hands for yes, says no). • Teacher reports that he can follow multiple steps commands in the classroom. After visual models (1-2), Hiro can demonstrate understanding and knowledge to do that task again. He points to things that he watns to know more about and is very curious and wants things to be explained for him. • Team reports that he's stubborn at times. He knows what he wants! • OT and SLP report that his attention is limited, even for preferred tasks (less than a minute for a task). • OT reports that procesing for a new task/unpreferred tasks can be slow. • PT reports he sustains attention for walks around the school at times and wants to request stickers (band aids). • OT Reminded team of diagnosis with "Brittle Bone syndrome" - needs to be considered for safety/fragility of his musculoskeletal system.	• Self-contained special education room • Transitions to some specials throughout the week (i.e home living, computers, adapted P.E.) • Related service providers provide groups throughout the week in the classroom • Home (points for what he wants, drags mom around to show what he wants) • Church (does not enjoy going) • Community (often tantrums/complains if they are in stores that don't have toys) • Diagnosed with "Brittle bone syndrome" - needs to be encourage for safety	• Communication breakdowns occur in unknown contexts - he will point and answer yes/no regarding wants, but that can be time consuming and cumbersome. • Limited verbal expression

Image 1: SETT Meeting notes on the Student, Environment, and Task for two case studies.

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and collect data for a couple of months. See **Image 2**.

With an agreement in place, I review the next steps with the team members. I provide sheets for team members to write down important words to be added to a device (e.g. family member names, favorite foods and toys). I also schedule training with each team member. A device does NOT go into a classroom until the teacher and PAs have participated in training. Similarly, a device does NOT go home until parents participate in training.

Following the meeting, I review the notes from the meeting and share a finalized version with everyone who was at the meeting. These notes are also added as an attachment to the student's IEP as a record of what communication tool we are trying and why.

FIFTH STEP: STARTING A TRIAL

So we've made a decision. Now what?

After a SETT Meeting, several things occur to prepare for a trial with a communication device. I obtain the equipment discussed and begin programming the device for the student, including personal information, important people, and additional words requested by the team. Programming a communication device can be labor intensive, especially if there are multiple languages involved. Our treating speech-language pathologists, teachers, program assistants and interns have all pitched in to help get devices ready for students. For example, if the student is receiving a program where color intensity and layout can be customized, if requested, I will meet with the team following the

TOOLS - Deena	
Tools Tried in the Past with Barriers: • Has used the iPad with Touch Chat with Word Power (42 Basic) in th classroom with success, but team feels that 42 pictures may be a bit overwhelming and distracing for her • Uses pictures to communicate concrete needs **Features of a Tool Discussed by Team:** • Direct select • Robust vocabulary • Sturdy case with a carrying strap so she can have her hands free for safety when moving through the environment. • Field of pictures was discussed; some mes Deena can be distracted/overwhelmed by the volume of pictures presented at one time on the screen (AAC Genie informa on/game presented - Deena broke down when the field of pictures grew to 45; the problem didn't seem to be the size, but the visual field.) • Mom reports that the pages being in English are fine - no need for page sets to be in Spanish.	**Tools Brainstormed and discussed with pros/cons based on features discussed:** **TouchChat with WordPower:** • Sentence building program with predicive features • 20, 42, or 60 (specific grid sizes) • fringe predicted for common phrases **Snap Core First:** • Core Word page stays put • Can be any size • Muliple levels for fringe page

TOOLS - Hiro	
Tools Tried in the Past with Barriers: • Go Talk 9 in the classroom - limited and doesn't include enough vocabulary. • In Speech sessions, has increased to a field of 24/48 pictures during some • Uses Go Talk 9 when he is engaged and mo vated, but gets bored easily with it and will throw it. **Features of a Tool Discussed by Team:** • Speech generating • Something that includes core and dringe vocabulary - needs more vocabulary • He double taps things - trying to select (Mom reports that this is likely a learned behavior because of his tablet at home) • Talked about a transport of the device - student not stable enough to carry his own device when prac cing walking • direct select, possibly key guard	**Tools Brainstormed and discussed with pros/cons based on features discussed:** • TouchChat with WordPower - dynamic display, speech generaing, sentence building • Proloquo2Go - dynamic display but core words are always accessible at the top, speech generaing (puts picture at the top), scrolls/swiping up within some categories (which is something that he is used to) • Team agrees that both will support Hiro's communicaion, but they favor Proloquo2Go because navigation is similar to his tablet at home • Chose a case and no shoulder strap that could compromise him physically

Image 2: SETT Meeting notes on the Tools for two case studies

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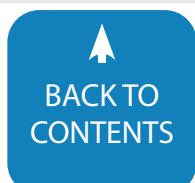
SETT Meeting to walk through the settings step-by-step to make decisions as a group. Even though this can take some extra time, devices are better prepared for students and team members have increased buy-in to using the communication devices.

Once the device is ready, training occurs for the treating team and parents (again, for classroom staff prior to a device entering the classroom, and for family members prior to a device going home). This training is an overview of how the communication device is organized. Staff members and family members have an opportunity to practice using a copy of their student's device. Helping someone learn to navigate the device and find words that are meaningful to them is fundamental to device integration. As individuals learn the vocabulary files, most become empowered to use their new knowledge. With motivation

to use the device and an understanding of how vocabulary is organized, we problem-solve on how to integrate the communication device into their routines and activities. (Sound familiar? This is very similar to the training I provide at the beginning of the school year!)

Our students are so excited to receive their devices and receive modeling from their supportive team and family!

Additionally, as we are setting up a student's device, we create goals to monitor progress during our device trial to determine whether this device is a good fit for the student. We set one goal in each of the four key competencies. These competencies are:

- Operational Competence - A student's ability to access their device and use the device's features. This reflects a

Monitoring/Data - Deena
Trail Goal
LINGUISTIC: Deena will use 2-word phrases to comment, label, and reject during a structured, language-based ac vity when given a verbal and visual prompt (two core/core + fringe)
OPERATIONAL: Deena will demonstrate the ability to manage simple message window operations (speak, clear, delete) given a delayed model Deena will navigate to logical page/message/vocabulary during a familiar topic or event given 1-2 gestural cues
SOCIAL: Deena will greet familiar people in school and will greet classmates by name with 1-2 visual or gestural cues
STRATEGIC: Requests or obtains the communication device (effectively manages it and transports it safely) given 1-2 gestural cues.

Monitoring/Data - Hiro
Trail Goal
LINGUISTIC: Hiro will use 2-word phrases to comment, label, and reject during a structured, language-based ac vity when given a verbal and visual prompt (two core/core + fringe)
OPERATIONAL: Hiro will demonstrates the ability to manage simple message window operations (speak, clear, delete) given a delayed model Hiro will navigate to logical page/message/vocabulary during a familiar topic or event given 1-2 gestural cues
SOCIAL: Hiro will greet familiar people in school and will greet classmates by name with1-2 visual or gestural cues
STRATEGIC: Requests or obtains the communication device (effectively manages it and transports it safely) given 1-2 gestural cues.

Image 3: SETT Trial Goals for two case studies

student's accuracy in access and communication rate.

- Linguistic Competence - A student's ability to use the language on the device. Students typically progress in developmental order, starting with core words at the one-word level before growing to phrases.
- Social Competence - A student's ability to communicate with familiar and unfamiliar listeners for a variety of communicative functions, including making requests, making comments, giving information, and asking for information.
- Strategic Competence - A student's ability to know that the communication device is the best way to communicate.

For more information on these competencies, please consult Janice Light's research: https://praacticalaac.org/?wpfb_dl=89

Our goals are based on these resources:
- Practical AAC Blog
  - https://praacticalaac.org/video/video-of-the-week-aac-data-collection/
- Augmentative and Alternative Communication Profile (Kovach, 2009)
  - https://www.therapro.com/Browse-Category/Augmentative-Alternative-Communication/Augmentative-Alternative-Communication-Profile-A-Continuum-of-Learning_2.html
  - https://www.proedinc.com/Products/34010/aacp-augmentative--alternative-communication-profile-a-continuum-of-learning.aspx
- Dynamic AAC Goal Grid-2 (DAGG-2)
  - https://www.mytobiidynavox.com/Resources/AAC-GoalWriting?Length=9&Length=9

Goals are written with input from the treating team. As you see in **Image 3**, these two students have the exact same goals, even though they are using different devices. Hiro had Proloquo2Go and at that time Deena had TouchChat with WordPower 20. We are truly looking to determine whether this device is a good fit for the student.

Teams are trained on how to take data, and **Image 4** is an example of data that I took for a SETT Trial. I write down words and phrases used along with the level of cueing. I also document what I modeled to evaluate at a later date whether what I modeled is used. It also serves as a reminder to teach the same skill multiple times before expecting independence. (I document independence with a capital I in a circle.) Teams do not have to use the data sheet that I create as part of the SETT trial, but everyone is expected to take data on these goals. This data will become a permanent part of the student's file, so that the next therapist and teacher can look to see why we made the decision that we did.

As you can tell from this example, taking good data is an ongoing process. One key thing to take away is that it can take a month or two (or longer) of modeling before we see any response by a student.

"Wait, why are you taking data? I thought that was someone else's responsibility!"

As an AT SLP, my job is to empower everyone to support a student with a communication device. Just as our students learn by watching us use their device, our teams learn by watching the AT SLPs interact with the student and take data. For the first student or two in a classroom who gets a communication device, I attempt to enter the classroom once a week to model how to model and answer the team's questions. As teams increase in their proficiency and confidence using communication devices, I pull back to less frequent check-ins.

Here again I must give credit to support from my amazing administration in setting realistic responsibilities; this has been fundamental in building my capacity to work with students participating in a communication trial on a weekly basis. We have tweaked my hours and additional responsibilities every school year to reflect the needs of our students with communication devices. Additionally, utilizing a team-focused approach for selecting a communication device reduces the other demands on my time. I have the opportunity to pause, prioritize, and spend the majority of my time in classrooms with students and staff. I empower others to help take the lead on implementing communication devices. Using a communication device with a student is a group effort and spending extra time at the beginning of a communication trial and at the beginning of the school year to ensure teachers, PAs, social workers, therapists, and parents have the skills and confidence to use a device makes a difference.

Of course, our students are not left in a device trial forever. The length of a trial depends on the student and our thoughts on how long it will take to gather data on the student's progress. For our more complex cases, trials have sometimes lasted most of a school year. For direct selectors who have stronger receptive language skills, we expect communication device trials to last about 12 weeks.

STEP SIX: SETT TOOL REVIEW

Once the team believes that we have enough data and evidence to make a decision on whether this communication device is a good fit for our student, the entire team meets again for a SETT Tool Review. In these meetings we make a decision as a team on whether this device is a good fit for our student, not a good fit for our student, or needs to be changed to be a better fit for our student.

Our meetings begin with an update on progress from each member of the team, followed by a discussion of progress on our trial goals. We decide whether this device is helping the student communicate more messages in more places to more peo-

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Image 4: Example of data from a SETT Trial

Current Tool: TouchChat with WordPower 20

Parent Report:
At home, Deena doesn't use it, unless mom doesn't undertstand her. When mom doesn't imdertstand, Deena goes to get her talker to tell mom. Deen tries verbally, but when not understood, the device helps in every situatiomn when other communication fails. Deena is really trying to use her voice, but will use her devivce when she cannon communicate her message. Deena will get frustrated when mom doesn't understant. Mom expects eena to use short sentences/phrases (when Deena requests milk, she has say "I want milk")

Teacher Report:
Deena uses her talker throughout the day.she Will use it to respond to questions. She knows how to navigate it. Deena may need a reminder to go get her talker. Deena is verbally trying to communicate in the classroom as well.

SLP Report:
Deena is requesting more accurately what she wants and needs. Deena gets really excited when you know what she wants. Deena uses total communication - she will use the sign for help (which she wasn't using prior to getting the talker). She is motivated to communicate.

Other information:
Social Worker: Deena brings her talker. She will put it to the side. Deena will not get what she wantys without using tyhe talker (requesting dinosaurs). Models feelings.

OT: Melanie's accuracy has increased. She is able to look through the pictures and find what she wants She is quick to find the button she wants.

Next Level:
SLP: Deena would benefit from decreased navigation tyo gert to words (increasing level to Basic 42). Translates to Spanish.

Teacher: Deena can handle more choices. Access to more words.

Mom: Deena has more words (in English); Mom has seen growth. Let's try the next level - Deena is speaking more. Deena knows her current talker really well.

<u>Summary of Meeting:</u>
- Device will go to Basic 42 in classroom and then Basic 548 Spanish for home.
- SLP will pull Deena to work in Spanish
- Mom will come for training in Spanish

Image 5: Deena's First SETT Tool Review Paperwork

ple. Our meeting concludes with a plan for our next steps.

For our case study Deena, her mom shared that she did not use her device except when mom did not understand her - then Deena would then go get her device. Deena understood the purpose of her device! With the device being used at home, mom thought that Spanish would be more helpful than she originally expected. The classroom team shared their excitement about how regularly Deena was using her device and their concern that her vocabulary layout had too many steps to get to the word Deena wanted. As a team, we decided to increase Deena's grid size from 20 to 42 and add Spanish support. Image 5 documents this meeting and these decisions; I do my best to document

accurately what each team member shares. See **Image 5**.

My support for Deena did not change following her first SETT Tool Review. I continued to support Deena and her team with modeling and took data on the same goals with the new layout. Deena's mom and older sister participated in another training on how to use Deena's new vocabulary file.

When we met again for an update on Deena's progress and to make a decision regarding Deena's communication device, her progress was clear, as can be seen in **Image 6**. Deena was taking the initiative to use her communication device, as needed, to get her message across. We were also encouraged to see that having a communication device helped promote Deena's

Current Tool: TouchChat with WordPower 42

Parent Report:
Deena uses her device to clarify her messages to her Mom when Mom does not understand her. For example, she wanted popcorn and she couldn't convey that message to Mom so she used her device to clarify. She also uses the animal page to tell Mom to draw the animals for her. She also uses it to tell Mom that she wants to go to school to see her friends. She uses it everyday to talk about the animals and 3-4 times a week to clarify her comments and requests.

Teacher Report:
Deena uses her device throughout the school day mostly for group lessons and snack. She is saying some words clearly and other times she is unintellible. When the listener says go get your talker and tell me again, she navigates her device to find the words to get her thoughts across. If a word is not on her device, she will find a words approximation for example fruit snacks she wen to fruit picture to get her request across. The talker did not have a picture of fruit snacks on it at the time. Deena remembers to carry her device with her wherever she goes. It should also be noted that at times. Deena does not need the device and will answer using 1 - word phrases.

SLP Report:
Deena uses her device activily to communicate her needs and wants but also to make comments and/or respond to questions. Often Deena will respond to a communicative partner verbally, but when asked to repair her communication due to not being understood, she will imediately seek out her device. She has domonstrated the ability to respond at various levels to communicate, such as the word level or sentence levels. She has an increased level of independence in accessing and activating vocabulary within and across various categhories (nouns, adjectives, action words, pronouns) within classroom and/or speech and language routines.

Social worker Report:
Deena brings and uses her device during individual and group sessions in SW. She also carries it with her anywhere in the classroom when I am pushing in during play t9ime. She knows many different categories in her device. She uses it to tell me what she likes or wants to play with or to tell me how she feels. During my large social work group, she has started to respond in single words or tries to approximate names of her peers (for example, happy, sad, mad, hi, and she tries to say her classmates names when I prompt the whole class to say "Hi John" for instance).

OT Report: Deena utilizes her device during different OT group activities. She appears to be able to navigate to the various windows to find the anwer to a given question. Deena started to be able to respond verbally with single words 9in certain situations, such as sying the correct color crayon to use.

PT Report: Deena brings her AT device to every PT session and she uses it 50% of the time. She is very independen with her device, but I think she chooses to use gestures, nonverbal language and single words because during PT she is in constant motion and she wants to eep moving. She uses more verbal language/single words dur9ing PT when there is 1 or2 other gir4ls/classmates in her PT session.

Image 6: Deena's Second SETT Tool Review Paperwork

Trial Goals:		
Area	Goal **(December 2018)**	Data Monitoring **(April 2020)**
LINGUISTIC	LINGUISTIC: Deena will use 2-word phrases to comment, label, and reject during a structured, language-based activity when given a verbal and visual prompt (two core/core + fringe)	Deena is independent.
OPERATIONAL	OPERATIONAL: Deena will demonstrate the ability to manage simple message window operations (speak, clear, delete) given a delayed model Deena will navigate to l ogical page/message/vocabulary during a fa-miliar topic or event given 1-2 gestural cues	Deena is independent
SOCIAL	SOCIAL: Deena will greet familiar people i n school and will greet classmates by name with 1-2 visual or gestural cues	Deena was able to do this on her de-vice, but she i s now attempting to do this verbally.
STRATEGIC	STRATEGIC: Requests or obtains the communication device (effectively manages it and transports i t safely) given 1-2 gestural cues.	Deena is independent

Places/Situations

Did the device help the person communicate in more situations?   YES X   NO

During the trial period, when and where did the person use this devicve?

____ greetings   _X_ making requests

____ feelings (mad, something hurts)   ___ Needs (bathroom, drinnk, etc.)

____ information about self   _X_ talks about their favorite topic

Examples:

People

Did the device help the person communicate with more people?   YES X   NO

Who did the person talk to using this device?

_X_ family   _X_ friends   ___ peers   _X_ teacher   ___ supervisor/boss

___ case manager   ___ coworkers   ___ staff   ___ aides/assistants   _X_ therapists

___ nurse   ___ doctor

Others: (please lists) _____

Summary of meeting:

- SLP, parents, and AT SLP will explore supporting the device in Spanish for use at home
- Device in English is very helpful at school and Deena is independently using it
- Communication Device (TouchChat with WP 42 Basic) is a great fit for Deena and she will continue to have access to it.
- Deena will be dismissed from the Assistive Technology SETT Process. The AT team can be re-consulted at any time.
- AT SLP will provide support as Deena Tranitions to a new school and a new team

(Continued) Image 6: Deena's Second SETT Tool Review Paperwork

verbal language. She was using her device across contexts to communicate more messages to more people.

At this point Deena's communication device trial is over and she will continue to have access to her communication device for the remainder of her schooling. After the trial, I began to work less frequently with Deena. As she switched therapists and classrooms, I continued to provide beginning-of-the-year training to her new team members. I am looking forward to watching her continue to learn and grow. As Deena develops literacy skills and verbal language, changes may need to be made to her communication device. If her current team needs to change her communication device for any reason, a new SETT Trial will begin, starting with team communication.

For our case study Hiro, he knew that his communication device was his voice, and he became adept at using it for what he wanted to say. Hiro's ability to navigate his communication device was exciting for team members. While he still has more to learn about language and appropriate social communication,

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Current Tool: Proloquo2Go

Parent Report:
Hiro knows what to do on his talker. He will go to his talker to say bye or tired. When expected to use it, he won't alsways follow through. At home, he pushes his device away when promted. When he is in his chair, he uses gestures and pushes his talker away.

Teacher Report:
Hiro is doing amazing. He will use talker during a lesson to respond to familiar questions. Hiro can navigate the screen and icons. He will explore his talker and find words. Without previously being shown, Hiro found a novel holiday (three step process). He understands his talker, Hiro will initiate communication with his talker.

SLP Report:
HIro has made a lot of growth - every day he is able to do more. He is able to navigate his talker. After seeing a new pathway once or twice, he is able to do it.
His communicating using 1 word - request, ask for words to be added, share preferences. He always talks about mom and MLK< his favorite topics. He can also use this talker for fun. concepts like Mickey Mouse Club

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Trial Goals:		
Area	Goal **(December 2018)**	Data Monitoring **(April 2019)**
LINGUISTIC	LINGUISTIC: Hiro will use 2-word phrases to comment, I abel, and reject during a structured, I anguage-based activity when given a verbal and visual prompt (two core/core + fringe)	Independently using 1 word, with a cue up to 2.
OPERATIONAL	OPERATIONAL: Hiro will demonstrate the ability to manage simple message window operations (speak, clear, delete) given a delayed model Hiro will navigate to l ogical page/message/vocabulary during familiar topic or event given 1-2 gestural cues	Independently using the message window Independently navigating familiar vocabulary
SOCIAL	SOCIAL: Hiro will greet familiar people i n school and will greet classmates by name with 1-2 visual or gestural cues	Independently sight reading classmates names
STRATEGIC	STRATEGIC: Requests or obtains the communication device (effectively manages i t and transports i t safely) given 1-2 gestural cues.	Independently will go to talker on stool at home to say tired. With a cue, will point to his talker

Image 7: Hiro's SETT Tool Review Paperwork

the team had enough data to conclude his communication device trial with the decision that this communication device was a good fit for Hiro. **Image 7** documents the meeting where we made this decision as a team.

When SETT Trials conclude, students don't notice a difference other than they will likely see me, the AT SLP, less frequently. The support they are receiving from their teachers, program assis-

tants, therapists, and parents continues. If at any point someone wants to change a student's communication device for any reason, a new SETT Trial will begin, starting with team communication.

I continue to keep an eye on all our students who use communication devices, providing beginning-of-the-year training for students' educational teams; facilitating a bi-monthly social

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Places/Situations
Did the device help the person communicate in more situations? **YES** NO
During the trial period, when and where did the person use this devicve?
____ in a group   _X_ at home   _X_ at school
____ at work   ___ Needs (bathroom, drinnk, etc.)
____ in the community e.g. _____

Type of Messages
Did the device help the person communicate more thoughts? **YES** NO

What kind of things did the person say with this device?
_X_ greetings   _X_ making requests
_X_ feelings (mad, something hurts)   ___ needs (bathroom, drink, etc.)
___ information aboiut self
___ talks about past events   _X_ talks about their favorite topic

Examples**:**
Bananas; Out; Mom; Bye; Tired; Sick; Look
Go Gym: Go X; Mom teacher go
Names
Help; Want help
Watch YouTube
My name is Hiro; What's your name?

People
Did the device help the person communicate with more people? **YES** NO
Who did the person talk to using this device?
_X_ family   _X_ friends   _X_ peers   _X_ teacher   ___ supervisor/boss
_X_ case manager   ___ coworkers   ___ staff   _X_ aides/assistants   _X_ therapists
___ nurse   ___ doctor

Others: (please lists) _____

In Review:
What are some features you like about this device?
Words with revlevent pictures; Easy to navigate

Summary of Meeting:
- Team agrees this is the best fit for Hiro
- Hiro will continue to have acces to Proloquo2Go
- Mom wants device over the summer
- Hiro will e dismissed from the Assistive Technology SETT Process. The AT team can be re-consulted at any time.

(Continued) Table 7: Hiro's SETT Tool Review Paperwork

group for our high school students; making a point to model in the classrooms; and modeling and answering questions in the hallway.

In my experience, providing assistive technology speech-language pathologists with greater flexibility in their schedule to meet the needs of students with communication devices is a powerful tool, and the ongoing training and support to these students and their teams will pay huge dividends for years to come. Adapting the process for getting a student a communication device to focus on team communication, modeling how to model, and taking data across competencies increases buy-in from every member of the team and helps build a supportive environment for students with communication devices.

I leave you with one last story. As I was training an abuela and abuelo (grandma and grandpa) to help their grandson, their grandson came in at the end of the training. I was attempting to cue him to say goodbye. He brushed me aside and pressed "I love you." With tears in her eyes, his abuela told us that this was the first time her grandson told her she loved him.

Giving a child a voice is powerful. Make time to help. ∎

Can augmentative and alternative communication (AAC) systems and interventions benefit from applied behavior analysis (ABA)?

An AAC experience reimagined from a behavior analytic lens

WHAT IS APPLIED BEHAVIOR ANALYSIS (ABA)?

Applied behavior analysis (ABA) is a science of learning and behavior that involves a process of applying psychological principles rooted in learning theory to improve behaviors of social significance (Baer, Wolf & Risley, 1968). ABA has been applied to many different areas such as, but not limited to: organizational behavior management, gerontology, sports and fitness performance, pediatric feeding disorders, conduct disorders, and most notably as an evidence-based intervention for people diagnosed with autism and other developmental disabilities.

While ABA is a scientific process focused on behavioral change, there are still a number of individuals including health professionals who hold a false view of the science. For example, one may hear "ABA" and imagine a child with autism sitting at a table being drilled with flashcards and being rewarded with micro sized pieces of candy. Sadly, this erroneous misperception of ABA has overshadowed how behavioral science can be applied to create positive and meaningful changes across individuals, technology and society overall.

This article will describe how behavioral applications and principles employed from behavior analytic theories of human language and cognition - most notably from the Analysis of Verbal Behavior and Relational Frame Theory (RFT) - can promote the development of language and functional communication and enhance the application of AAC technologies.

ALL COMMUNICATION IS A FORM OF BEHAVIOR, AND VICE VERSA.

Communication through gestures, pointing, eye contact, smiling, speaking and using augmentative and alternative

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LING LY TAN, M.ADS, BCBA. Ling Ly Tan is a Board Certified Behavior Analyst and an Ontario Autism Program Clinical Supervisor with over seventeen years of direct clinical experience implementing behavioral interventions. She served as Co-Chair for Seneca College's Program Advisory Committee for Behavioral Psychology and Behavioral Health Sciences, a Subject Matter Expert on program and curriculum development, and has taught courses in Applied Behavior Analysis (ABA) for over five years. Ling has also presented internationally to increase awareness on ABA and evidence based practices for individuals with autism and developmental disabilities.

Ling is extensively trained in the application of Skinner's Analysis of Verbal Behavior to teach language and communication, including sign language, Picture Exchange Communication System (PECS), and other speech generating devices to individuals with limited to no speech. As part of a strong desire to serve the disability population at large, she developed Linggo, an Augmentative and Alternative Communication (AAC) system. Linggo launched in January 2021 and was recently awarded two research grants to evaluate the effectiveness of the AAC and its training methods across children with complex communication needs and adults living with stroke and dementia.

communication to express oneself are all different forms of behavior. Similarly, problematic behaviors such as protests, outbursts, aggression and self-injury that are commonly displayed in individuals with significant disabilities and complex communication needs are different forms of communication. As such, using behavioral principles applies to both increasing and improving communication and reducing challenging behavior. This has often been demonstrated with behavioral interventions such as Functional Communication Training (FCT). Functional Communication Training has been acknowledged as the most published function based treatment and the most common and effective approach to address severe problem behavior (Tiger, Hanley & Bruzek, 2008).

Functional Communication Training includes the use of behavioral applications such as differential reinforcement for alternative behaviors, while "untraining" the learning history for challenging behaviors through a process of extinction. Differential reinforcement is a method where specific or more desirable behaviors are reinforced and extinction is a method to decrease behaviors by withholding reinforcement for previously reinforced behaviors.

In the case of AAC intervention, alternative communication is then taught and reinforced to replace previous challenging behaviors. For example, Sigafoos et al. (2013) implemented FCT with the use of a speech generating device (SGD) for a child diagnosed with a developmental disability and limited speech. It was observed that the child behaved aggressively when he wanted access to toys from another person. The intervention focused on teaching the child a more socially acceptable form of communication by prompting the child to select the "toy play" icon on his SGD instead of engaging in aggressive behavior. After several prompted teaching trials, the prompt was faded to allow for the child to independently communicate with his SGD. The child's new skill of requesting through his SGD generalized to other objects and activities, and the intervention was associated with a significant reduction in aggressive behavior.

APPLICATION OF THE ANALYSIS OF VERBAL BEHAVIOR (VB) TO IMPROVE LANGUAGE AND COMMUNICATION

B.F. Skinner (1957) defined verbal behavior as "behavior reinforced through the mediation of other people in ways to reinforce the behavior of the speaker of the verbal community (p. 2.)…and that the behavior is "conditioned precisely in order to reinforce the behavior of the speaker." (p.225) These behaviors include forms of communication such as, but are not limited to gestures, vocal speech, writing, etc. Skinner's definition of verbal behavior can be analogous to the definition of "communication" as described by the American Speech-Language Hearing Association where "Communication is the active process of exchanging information and ideas. Communication involves both understanding and expression. Forms of expression may include personalized movements, gestures, objects, vocalizations, ver-

balizations, signs, pictures, symbols, printed words, and output from augmentative and alternative (AAC) devices." (Beukleman & Mirenda, 2013). While the term verbal behavior and communication are similar in their descriptions, Speech-Language Pathologists and Behavior Analysts may not share common views. This may be due to differences in theoretical underpinnings of language and their intervention approaches despite having a shared goal of improving language and functional communication for individuals with complex communication needs. A shared understanding of language constructs, verbal behavior and its applications may enhance collaboration between clinicians and foster positive partnerships to develop effective AAC intervention strategies.

Skinner (1957) analyzed communication and classified language into verbal operants, where language is characterized by the interactions between the individual and their environment, rather than by their form or topography. For example, the use of the word "juice" may serve to reinforce the requesting behavior of the speaker when an individual is thirsty. However, when the individual is asked to label a glass of juice in front of them, or answer the question "What's your favorite drink?", the use of the word "juice" may not exist outside of the requesting repertoire. The primary verbal operants that form expressive language include mands, tacts, echoic and intraverbals. Mands are commonly known as requests. For example, pointing to the item you want on a shelf, or saying the phrase "I need help." and "I'd love some water" are considered mands. Tacts are labels or comments made that serve a social purpose. For example, when a child labels different items in a book to a teacher and says "It's a hexagon!" the social reinforcement is provided from another, such as "Yes, that's correct". Tacting is similar to commenting. For example, one may see a clown and yell "Agh! A clown!" and the response from another person may be "Ah! Clowns are scary." Intraverbals can be likened to a conversation where an item or situation is not in the present environment. For example, responding to a question "How was your vacation in Hawaii?" would require the individual to recall and describe the events that occurred on their vacation. For many clinicians, the ultimate language intervention goal for individuals with complex communication needs is communicative autonomy and the ability to engage in social conversations at length. While a complex intraverbal repertoire may be the ultimate desired treatment outcome, it is strongly recommended that the learner have reliable listener skills and a strong verbal repertoire of mands and tacts prior to intraverbal training (Sundberg, 2011; Vedora & Conant, 2015).

Language curriculum and assessment protocols such as the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP), the Assessment for Basic Language and Learning Skills - Revised (ABLLS-R) and Promoting the Emergence of Advanced Knowledge (PEAK) provide language instruction guidelines and are currently widely adopted in ABA intervention

programs of children diagnosed with autism and other developmental disorders.

In the process of creating an AAC intervention to improve functional communication and increase language, the vocabulary repertoire within an AAC system can be customized and teaching steps programmed to establish mands, tact and intraverbal repertoires in an individualized and developmentally sequenced manner.

APPLICATION OF RELATIONAL FRAME THEORY (RFT) TO BUILD LITERACY SKILLS THROUGH SIGHT READING

Literacy skills are paramount to an individual's capacity for school inclusion, community engagement, job placement and overall quality of life. Literacy acquisition is especially important for individuals who use AAC since it permits them to communicate in a non stigmatizing manner that is clearly understood by others in their community. Unfortunately, individuals who rely on AAC to communicate have difficulty building literacy skills, and little is known about the best types of literacy instruction for those who use AAC (Barker, Saunders & Brady, 2012).

Relational Frame Theory is a radical behavior analytic theory of human language and cognition based on the premise that language is developed through relational frames. Relational frames are developed through our ability to identify and create relational links between stimuli (i.e., words, events, speech, pictures, etc.) . There are three primary driving processes that help establish links and relationships between events: mutual entailment, combinatorial entailment and transformation of stimulus functions. With mutual entailment, an individual may learn that two stimuli are related in some way. For example, if we taught a child the dictated name "flower" is the same as a picture of a flower, the child will associate the picture itself and may say "flower" when shown a picture of a flower. Combinatorial entailment is a concept that describes how more than three stimuli become interrelated. In this case, if the child is then taught the written word FLOWER is the same as the dictated name "flower", the child may learn without previous training that the written word FLOWER is the same as the picture of a flower. Transformation of stimulus functions is a concept where novel relations are built. For example, through repeated exposure to different flowers, the child may learn that flowers have specific features such as petals and a stem. Transformation of stimulus functions occur when the child is then shown a novel exotic plant that displays these features - and based on previous derived relations, will label it as a type of flower. Derived relations that are created between various stimuli can account for the generativity of human language (Murphy & Barnes-Holmes, 2009).

Development of literacy skills via sight reading have been demonstrated in earlier research using procedures in RFT and stimulus equivalence training. Rehfeldt and Root (2005) used RFT procedures to teach three adults with developmental disabilities to establish derived requests using text instead of pictures after being taught to establish two relations: 1) dictated name to picture and 2) dictated name and corresponding text. Similar procedures were demonstrated to teach derived requests using text through a touch screen tablet in an additional research study with 11 children who were non-vocal and diagnosed with autism (Still et al., 2015). RFT techniques to build literacy skills are rooted in earlier research studies that applied stimulus equivalence training to teach literacy in teenagers with Down Syndrome and intellectual disabilities (Sidman, 1971; Sidman & Cresson, 1973).

Sight reading may be established in AAC systems using teaching strategies rooted on RFT where an individual can build understanding that the picture, corresponding text and the dictated name are all functionally equivalent. Over successive trials, a clinician or teacher can successively fade pictures over time as the learner begins to communicate using the text alone [Fig. 1]. Picture fading to establish textual responding can be applied across low tech paper based AAC systems and speech generating assistive devices, such as Linggo.
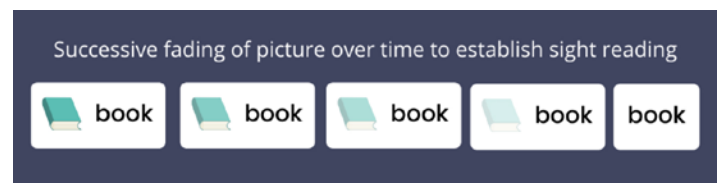

Figure 1. Transition to literacy: Pictures are faded successively over time through transparency or size

APPLYING TIME DELAYS TO INCREASE VOCAL SPEECH

Time delays procedures consist of inserting a predetermined amount of time between the target stimulus and the prompt - and are used to promote independent responding. Time delays have been incorporated in interventions to increase vocal speech in children with autism and developmental disabilities using manual sign language (Carbone et al., 2010) and with speech generating devices (Gevarter et al., 2016; Gevarter & Horan, 2019). Alzrayer (2019) applied a progressive time delay of up to 5 seconds to elicit vocal requests in four children diagnosed with autism. In this study, the participants were taught to request with word tiles "I want" + preferred item" using the iPad. A progressive time delay was applied to the speech output of the PECS IV+ app for up to 5 seconds. If the child vocalized prior to timed delay speech output of the PECS IV+ app, access to the preferred item was immediately given. However, if the child did not vocalize within the 5 second time delay, the researcher gave the preferred item immediately after the elapsed period. The results showed that all participants demonstrated an increase in spontaneous vocalizations after a time delay was applied. See Figure 2 for example of how a time delay is applied within Linggo, a novel SGD.

Figure 2. A time delay is applied to the word "book" as a method to elicit a vocal response

HOLDING PROFESSIONALS ACCOUNTABLE: USING DATA TO EVALUATE AAC INTERVENTION

Applied behavior analysis distinguishes itself as a science that holds its clinicians accountable to their methods and interventions. With data collection and analysis, a clinician can discern whether or not their intervention methods are responsible for the behavioral changes.

Using quantitative and qualitative data collection methods to assess intervention effectiveness is an ethical and mandatory practice for all those providing therapeutic services for individuals with significant disabilities and have complex communication needs.

AAC interventions can be enhanced with the rigor of data analysis on several areas of communication and language development. This can include recording independent and prompted communication over time, assessing different uses of language and communication (i.e., mean length of utterance, vocabulary used to request versus comment), frequency and fluency of communication. In addition, data collection can assess whether various teaching methods are successful in achieving language and communication goals. For example, data collection on various prompting procedures can determine whether a specific prompting procedure is effective for the learner to achieve independence with communication or facilitates prompt dependencies.

SUMMARY

There is a growing body of clinical research demonstrating evidence-based interventions rooted in behavior analytic theories of language and learning. The theoretical underpinnings of Verbal Behavior and Relational Frame Theory can assist clinicians with a framework that establishes a foundation for functional communication and language skills. Applied Behavior Analysis seeks to demonstrate that the intervention strategies employed are indeed effective in promoting language and communication for individuals with complex communication needs using AAC. AAC technologies and interventions can be enhanced with data collection. Rigorous data collection can support clinicians in the assessment and evaluation of intervention effectiveness - saving unnecessary wasted time and financial resources for all stakeholders involved. Most notably, ABA is a natural science that seeks to improve behaviors of social significance. All individuals have a right to effective treatment and using evidence informed intervention strategies to empower individuals to communicate effectively with an AAC system is undoubtedly of social importance.

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Linggo does more than serve as a voice and communication system for individuals with complex communication needs. Our technology was created to help therapists, parents and caregivers deliver an AAC experience that combines evidence based teaching strategies designed to improve speech and literacy over time, while using best practice methods through data collection and progress monitoring from communication partners.

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