Technology In Context: Aligning Speech-Language Interventions with Research-Based Methods

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Disclosures

- Receive royalties for 5 apps developed with Smarty Ears Apps.
- Contractual relationship with Mindwing Concepts, create blog content and presentations related to products such as Story Grammar Marker®, receive consulting fee but no share of product sales. These approaches will be discussed along with others for narrative and expository intervention
- Receiving honorarium from PaTTAN for this presentation
- Presented for various local and national organizations on tech integration.
- Nonfinancial: creator of blog SpeechTechie, contribute columns for ASHA Leader.

What is the role of research in our practice?

- Using evidence to guide decisions in communication sciences and disorders is an integral part of our science-based field (Wolter, Corbin-Lewis, Self & Elsweiler, 2011)
- Evidence-based decisions have been emphasized within graduate training programs for the past 15 years (Dollaghan, 2007)
- Within schools, aligning practices with research aligns with federal regulations such as the Individuals with Disabilities Education Improvement Act of 2004, including studies and articles "which have been accepted by peer-reviewed journals or approved by an independent panel of experts" (Hoffman, Ireland, Hall & Flynn, 2013)
- However, "The notion that external research evidence somehow "trumps" all other considerations is one of the big myths surrounding EBP" (Mullen, n.d.)
- Overall, there is a lack of high-quality and relevant research available in the field of speech-language pathology (Dixon, 2014)

ASHA's EBP Model:

Current Best Evidence

Clinical Expertise — Client Values

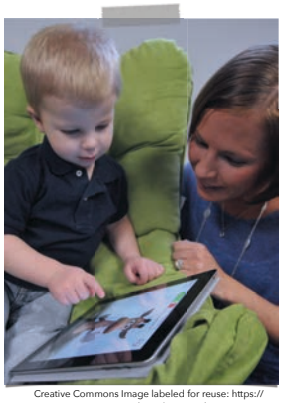
"The goal of EBP is the integration of: (a) clinical expertise/expert opinion, (b) external scientific evidence, and (c) client/patient/caregiver values to provide high-quality services reflecting the interests, values, needs, and choices of the individuals we serve. Conceptually, the trilateral principles forming the bases for EBP can be represented through a simple figure." (via https://www.asha.org/members/ebp/)

Levels of Evidence

Level	Description
Ia	Well-designed meta-analysis of >1 randomized controlled trial
Ib	Well-designed randomized controlled study (RCT)
IIa	Well-designed controlled study without randomization
IIb	Well-designed quasi-experimental study
III	Well-designed non-experimental studies, i.e., correlational and case studies
IV	Expert committee report, consensus conference, clinical experience of respected authorities

We don't expect the existence of studies on individual books, games or toys, but incorporate evidence-based techniques in the context of the use of engaging material.

Similarly, the use of apps with clients provides a context or material *per se,* in which we can employ research-based strategies and interventions.



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EARLY LANGUAGE LEARNING AND PLAY

- Fisher (1992) conducted a meta-analysis of 46 studies focused on the effects of play behavior in cognitive, linguistic, and affective-social development
- Studies surveyed a) cognitive development (i.e., creativity, logical problem solving). b) the effects of play on language and literacy development or c) play's role in building social cognition- awareness of social roles, interpersonal skills via make-believe and perspective taking
- Results suggest that sociodramatic play results in improved performances in both cognitive-linguistic and social affective domains
- In addition, Autism EBP Review Group (2014) cites Structured Play as evidence-based

Language and play activities can be facilitated with apps such as Dr. Panda Toy Cars (Free/$2.99 for iOS and Android), MarcoPolo Weather (Free for iOS and Android)

CLINICAL EXPERIENCE "IN PLAY"

Rehearsal of play via apps can provide scripts to clients with weak language, play and social cognition

Inclusion of symbolic elements models more complex play and "initiating events"

Tips for play-based app use

- Apps are for **co-engagement** (see AAP's "Beyond Turn it Off" and Cooney Center's "Family Time with Apps")
- Hold the device as you would a book; avoid giving complete control to the client(s)
- Choose quiet apps with language neutrality (think of wordless picture books)
- Avoid apps with restrictive pace or timing
- Choose the level of interactivity right for your client(s) age, developmental level and behavioral patterns to maximize elicitation of language while using an app
- Explore catalogs of Sago Mini, My Playhome, Toca Boca, Dr. Panda

Criteria for Selecting "Out of Box" Apps?

Fairly Priced | Interactive | Visual | Educationally Relevant | "Speechie"

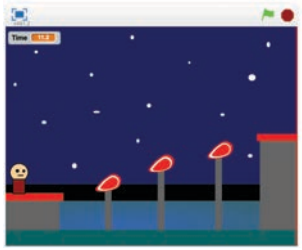
Davis and Sweeney (2014)

The Role of Context

- A study comparing contextualized to decontextualized language intervention revealed signs of efficacy in an intervention approach in which clinicians treated multiple linguistic targets using meaningful activities with high levels of topic continuity, referring to sentence and discourse measures (Gillam, Gillam & Reece, 2012)
- Considering context has facilitating impacts on grammatical (Fey, Long & Finestack, 2003) and vocabulary development (Beck, McKeowan, & Kucan, 2003)
- Context also directs us toward client interests/values, eases planning as activities can follow a topic "flow," and facilitates access to curriculum within schools

Extending Play to Older Students

- YouTube videos elicited retelling and social narrative, reading nonverbal cues
- Project-Based Learning/Play Opportunities of building a LEGO ANW course and making a video. See research on LEGO and social/cooperative skills (Lindsay, Hounsell, & Cassiani, 2017)
- Brief opportunities for cooperative video game play
- Incorporation of CBT-Based Techniques such as The Zones of Regulation® and Incredible 5 Point Scale



LEGO® course created by 4th graders, ANW game on Scratch, online

The Group Role Scale

		What it looks like
5	Exploder	So stuck he explodes- and the activity does too
4	Blocker	His actions and reactions repeatedly stop the group from moving forward
3	Sander	His responses and tone are impatient or harsh and change the tone of the activity
2	Flow-er	He goes with the flow of others' ideas and adds his own
1	Easer	He helps others to participate and add their ideas

PowerPoint, Google Slides, are great tools to make 5 Point Scales

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- Fey et al (2003) conducted a systematic review of research and suggest 10 principles for grammatical intervention
- These include:
  -Having a goal of ultimately facilitating grammatical development in "conversation, narration, exposition, and other textual genres in both written and oral modalities"
  -Manipulating context to create more frequent opportunities for grammatical targets
  -Exploiting different textual genres and the written modality to develop appropriate contexts for specific intervention targets
  -Manipulating discourse so that "targeted features are rendered more salient in pragmatically felicitous contexts"
  -Contrasting forms used by the child with more complex forms through sentence recasts
  -Using elicited imitation to make target forms more salient and to give the child practice with phonological patterns that are difficult to access or produce

Tools such as Toca Life: Farm ($2.99 for iOS and Android) and Book Creator (free to try, then $4.99 for iOS and Android, free for Chrome) can be used as motivating contexts for grammatical intervention

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- Cleave et al (2014) conducted a meta-analysis of research evidence on the effectiveness of conversational recasts
- Recasts, mentioned previously in this presentation, are responses "in which the adult repeats some or all of the child's words and adds new information (semantic, syntactic, or phonological) while maintaining the basic meaning expressed by the child"
- Types of recasts include corrective/ noncorrective, simple/complex, focused/ broad, and should be developmentally appropriate and presented in an interactive context
- Studies support the use of recasts "in programs to facilitate the use of grammatical targets by children with specific LI when they are focused on specific intervention targets…"

Sago Mini Space explorer ($2.99 for iOS and Android) specifically provides an interactive context for the use of action words in present and past tense.

A Few Notes on the Importance of Narrative

- Students with LLD produce oral and written narratives with lower productivity (e.g. total T-units and words), reduced grammatical complexity, with difficulties somewhat amplified in expository contexts (Scott & Windsor, 2000)
- "Today's public school students often are required to generate or retell stories in the classroom, and they are evaluated on their ability to express themselves using precise vocabulary and grammatically appropriate sentences in this genre" (Sun & Nippold, 2012)
- SLPs can focus on "language underpinnings," e.g. structure of narrative and expository text within classroom contexts (Ehren, 2009)
- Narrative language also affects children's social competence. Students with narrative language difficulties may be at risk for developing social and behavioral problems related to conversation skills and perspective taking (Peterson et al, 2014)
- Problem-solving and narrative are closely linked through situational awareness and perspective-taking (Westby & Noel, 2014)

Approaches to Intervention

A Multi-tiered Language Intervention Curriculum

- StoryChamps® (www.languagedynamicsgroup.com)
- Gillam & Gillam's SKILL Program
- Story Grammar Marker® (www.mindwingconcepts.com) are research-based programs using icons for character, setting, initiating event, and other story elements
- For older students, can use acronyms such as SPACE (modified here from Westby & Noel, 2014)

S-Setup (Character and Setting)
P-Problem/Plot/Plan
A-Actions
C-Consequence
E-End

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

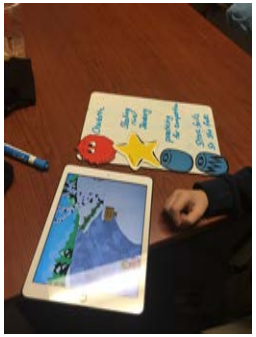
- Recent study comparing specific story grammar instruction (Narrative Elaboration Treatment-NET) with traditional literacy program. Interventions targeted use of an icon-based visual support to teach story elements and connections between them (Gillam, Olszewski, Fargo & Gillam, 2014)
- First study to look at efficacy of SLP co-teaching in classroom
- A comparison class used common comprehension instruction strategies regarding presented stories: think-alouds, visualization, beginning-middle-end story mapping, dramatization, and answering wh-questions
- Also see Petersen, 2014

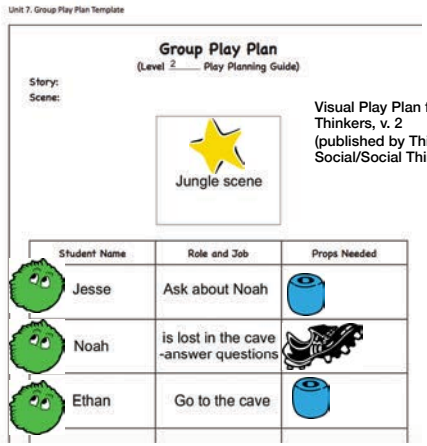
Consider Alignments with SGM® ($14.99), Kidspiration/Inspiration (Free to Try), Toontastic or other narrative contexts

TOONTASTIC 3D FEATURES

- Simple animation creator
- Choose or draw characters and setting.
- Animation created by touchscreen/audio recording
- Sharable to camera roll
- Free for iOS/Android
- Clinical Use: Construct story map as pre-activity and create narrative within available or personalized theme. Also useful for social situations, dialogues and scripts

Using Graphic Organizers (icon-based) alongside tech resources





Unit 7. Group Play Plan Template

Group Play Plan

(Level 2 Play Planning Guide)

Story:
Scene:

Jungle scene

Student Name	Role and Job	Props Needed
Jesse	Ask about Noah	
Noah	is lost in the cave -answer questions	
Ethan	Go to the cave	

Visual Play Plan from We Thinkers, v. 2 (published by Think Social/Social Thinking®)

PIC COLLAGE FEATURES

- Combine pictures together in "collage"
- Trim picture feature results in *gestalt*
- Search pics from web within app- lends itself to quick creations
- Save creations to camera roll for sharing (also social features you can turn off, or use Pic Collage Kids app)
- Free
- Clinical use: Make a photo collage that tells or retells a story; apply story grammar structure

E-BOOKS- FREE OPTIONS

Epic Books for Kids: App for multiple platforms, a "Netflix for children's books." Provides free educator accounts

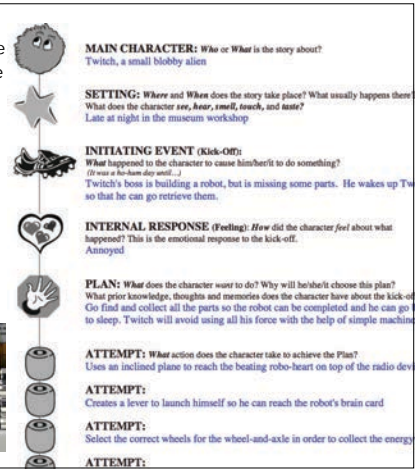
Unite for Literacy: free books with text and audio narration, web-based (works on any platform). Tend to be simple narrative or expository (list, sequence, description)

Other tech-mediated narrative resources

- Look for narrative in apps and websites (e.g. Toca Life apps)
- Your own photos
- Getty Images/Google Images
- YouCue Feelings (Anna Vagin), see book, YouTube channel, Twitter

Tech Tie-ins with Disciplinary Language and Literacy: a simple strategy

- Pair an activity with a graphic organizer to promote narrative/ expository language and microstructures
- E.G. Museum of Science and Industry Simple Machines website (flash-based)



Expository/Informational Language: Another frontier

- Students are expected to understand and use discourse including "explaining ideas"
- Expository language comprehension and writing is different from narrative!
- Several recent meta-analyses support teaching expository text structures to support comprehension (Hebert, 2016, Pyle 2017)
- Strategies here are related to self-regulated strategy development-SRSD, writing processes (McMaster et al, 2018)
- Ukrainetz (2018) describes "Sketch and Speak" strategy for expository language with improvement in oral expression!

Text Structure	Function	Key Words	Comprehension cues
List	gives a list of things related to a topic	an example, for example, one, another, also, for instance, to illustrate (commas or visual markers also signal a list)	Describe and give examples of…
Sequence	tells what happened or how to do something	First, then, next, second, third, following, finally, subsequently, before, after, eventually	Give the steps… Tell how…
Cause-effect	explains or gives reasons why	because, since, reasons, then, therefore, for this reason, results or effects, consequently, so, in order to, thus, hence, influences, leads to	Explain… Predict… Why/How did ___ happen… Give the reasons (causes, effects, results) of…

(Westby, 1998)

Text Structure	Function	Key Words	Comprehension cues
Descriptive	tells what something is	is, is called, can be defined, means (also attributes signal descriptive structure)	Define.. Describe… Tell about…
Problem/Solution	states a problem and offer solutions	The problem was, a solution was, challenges, ways, but, however	Describe the problem of… What are some solutions for…
Compare/Contrast	shows likenesses and differences	different, same, alike, similar, dissimilar, disparate, although, on the other hand, or, however, compared to, contrasted with, instead of, yet, but, still	Compare and contrast… Discuss similarities and differences… How are___alike and different…

SRSD includes parallel strategies like
POW (pick my idea, organize my notes, write and say more).
T, topic sentence—tell what you believe!; R, reasons, three or more—Why do I believe this? Will my readers believe this?; E, ending—wrap it up right!; E, examine—do I have all my parts?

Tech resources to set context and engagement for developing expository language

- Brainpop, Brainpop Jr provide engaging videos and games in which expository text structures are embedded
- newsela is source of high-interest current event articles, generally containing structures of information
- Advertisements interesting for kids on YouTube, as well as other videos
- Use Kidspiration and Inspiration for text mapping

BOOK CREATOR FEATURES

- Multimedia Book Creator
- Simple interface for drawing, adding text, images, video, and audio, along with word and thought balloons
- Sharable in multiple formats (sets this app apart)
- Free to try, $4.99 for full features
- Clinical Use: Make a book that tells a story with photos, sketches, audio. Add audio to a Pic Collage

APPS PARTICULARLY ADAPTABLE TO EXPOSITORY LANGUAGE

- Explain Everything or Educreations, Adobe Spark Video, Haiku Deck (and Google Slides), Tellagami, Chatterpix Kids




ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- Recent study on expository language of 235 typical 5th-9th grade students (Heilmann and Malone, 2014)
- Language Sampling and Analysis (LSA) procedure used with emphasis on schema and expository text structure
- Students with language difficulties naturally continue to struggle as the language demands of the curriculum become more intense over later years in school
- Study provided data on many aspects of language samples collected with elicitation procedure following a "planning activity"

Align with therapy procedures with Explain Everything ($2.99) or other free whiteboard apps (e.g. Educreations)

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- Language Complexity- Mean Length of C-Unit (the independent clause plus all associated subordinate clauses) as well as Clausal Density (frequency of subordinate clause production)
- Lexical Diversity- variety of words used
- Productivity and Fluency- including total number of words and C-units
- Expository structure and effectiveness- the authors developed an Expository Scoring Scheme aligning with the planning sheet (described more below) and rubric for scoring
- Error Analysis-particularly related to grammatical errors

Align with therapy procedures with Explain Everything ($2.99) or other free whiteboard apps (e.g. Educreations)

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- Gill et al (2003) studied the use of strategies to facilitate comprehension and following of verbal directions, an important early learning skill
- Research activities supported the use of a combined rehearsal and visualization strategy for following directions. The authors defined rehearsal as repeating/paraphrasing key elements of the direction and visualization as 'seeing it happen,'' or ''imagining the task finished.'' The authors indicated this strategy use was demonstrated as students repeated directions and looked at relevant objects as directions about them were given. The combination of the two strategies was found to be more effective in promoting accuracy and maintenance of skills than repetition alone

The abstract elements of these strategies can be emphasized visually with Comics Head (Free). School of Multistep Directions ($24.99) and open-ended apps such as Doodle Buddy (Free, Drawing Desk for Android) can be used for practice of the skills before transfer into classroom environments

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- German et al (2012) studied methods in developing word retrieval and vocabulary
- Students received only semantic instruction (e.g. word mapping) or a combination of semantic and phonological techniques (developing sound-alike cues for words, syllabification, rehearsal). Greater gains were noted when form-based instruction was added to the semantic interventions

Kidspiration or Inspiration maps (free to try, $9.99) provide semantic mapping, sorting, and options related to word form

Pic Collage (free for iOS and Android) provides a unique space to combine both semantic and structural word instruction with photo search and text additions

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- The "Writing Next" meta-analysis (Graham & Perin, 2007) studied interventions to improve writing and written language, including sentence combining
- Sentence combining involves exercises in which students work to combine simpler sentences into more complex sentences according to a variety of structures (e.g. adjectives, causals). These activities were found to have a moderate effect size and be more effective than traditional grammatical instruction
- Kilgallon provides specific "worktexts" using this method, also see Singer presentation (searchable)

Popplet Lite (Free, also available as online tool) provides an interactive and engaging space to connect simpler sentences through conjunctions and other structures, and to re-write sentences.

What is a social narrative?

- "Narratives that describe social situations in some detail by highlighting relevant cues and offering examples of appropriate responding . Social narratives are individualized according to learner needs and typically are quite short, perhaps including pictures or other visual aids." (Autism EBP Review Group, found effective with 17 studies)
- Effective preschool-HS age. BUT social narratives need a "spin" as students get older.

Social Stories ™

- There are many kinds of teachers in school. (Descriptive) It may be hard to get used to new teachers because I don't know them very well. (Descriptive) I will have a new teacher next year. (Descriptive) Her name is Mrs. Jones. (Descriptive) She will visit me on Tuesdays until the end of the year for a short time before lunch. (Descriptive) When I am with Mrs. Jones, I will try to be a good listener. (Directive) She is so happy when her students listen with their whole bodies. (Perspective) It may be fun to meet with Mrs. Jones because we might play games, listen to music, or just talk. (Descriptive)
- Suggested social story ratio- 2+ Descriptive/Perspective Statements for every Directive
- Check out the Social Story Sampler online

Google Images and Getty Images are good sources of engaging visual supports
(this is essentially a social narrative, a research-based practice)

The Group Plan

- **Use Alexa to play 20 questions**
- **Share an imagination about the item**
- **Answer accurately, brain in the group thinking about the item**
- **Cause comfortable thoughts in others by answering only when its your turn**
- **Think with your eyes about the teacher if you need help**
- **Item: Zebra**

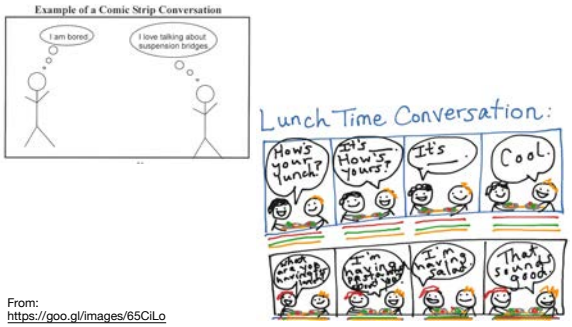
bit.ly/alexainclassroom

Next: Presenting a Plan to a Group

Comic Strip Conversations

- A more interactive way to let a social narrative "unfold" in a constructivist manner
- Consider for higher level students and those with resistance
- Key elements: conversation, sketching, narrative, problem solving, situational elements, stick figures, word balloons, thought balloons (possible color coding)

Comic Strip Conversations



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5-Point Scales

- Author: Kari Dunn Baron, Based on Systematizing-Empathizing Theory (Baron Cohen) and Cognitive Behavioral Therapy (CBT)
- Break a problem or situation into 5 parts
- Build nuance, situational awareness, provide feedback, reduce power struggles, teach perspective, emotional intelligence
- Develop with students on "mutual agreement" (helpful to introduce concept with some basics first, some resources from Dunn Baron's book and bit.ly/5pointscalespres follow)

The problems Scale

What it looks like

5	Huge Problem
4	Big Problem
3	Medium Problem
2	Little Problem
1	Tiny Problem

Time to solve
Hurt factor
Needing help
People involved

Concepts:
-Size of Problem should match size of reaction
-Your reaction can be another's problem

TPT resource "Describing and Solving Problems"

Technology and 5-Point Scales

- Engaging/motivating
- Hard to find Yellow Expos!
- PPT/Keynote/G Slides have colors and tables
- Additional columns elaborate perspectives and examples
- Duplicate one slide/scale and make a new one!
- Students benefit from "anchor" points in developing
- See resources discussed earlier- 5 Point Scales can be exemplified with other tools: animation, sketching, games in Kahoot

The Silly Scale

		What it looks like
5	Dangerously Silly	pushing humor about private parts
4	Disruptively Silly	same joke told or laughed about more than 2 times Touching
3	OK to LOL (Laugh out Loud)	Group is laughing
2	Amused	Something causes a smile.
1	Not Silly	Typical serious/listening or talking mode

The "what I know" Scale

		What it looks like
5	Arrogant	I'm right and you're wrong
4	Confident	I know this/I've experienced this
3	Open	What do you know about this?
2	Unsure	I might know something about this.
1	Oblivious	I know nothing about this.

Tech-Based Resources for Implementing these Strategies

- Book Creator for sketching and writing (visual supports)
- Pixton (web/flash-based)
- Developing Social Narrative in PowerPoint/Keynote/Google Slides

Visual Supports

- Useful for a range of interventions and **all students**, for general language or social. Take the language out of the air!
- "Visual supports (VS) are concrete cues that provide information about an activity, routine, or expectation and/or support skill demonstration.Visual supports can provide assistance across activity and setting, and can take on a number of forms and functions. These include but are not limited to: photographs, icons, drawings, written words, objects, environmental arrangement, schedules, graphic organizers, organizational systems, and scripts. Visual supports are commonly used to: 1) organize learning environments, 2) establish expectations around activities, routines, or behaviors (e.g., visual schedules, visual instructions, structured work systems, scripts, power cards), 3) provide cues or reminders (e.g., conversation and initiation cues, choice making supports, visual timers, finished box), and 4) provide preparation or instruction." (Autism EBP Review group, found evidence based w/ 18 studies on a range of contexts: activity schedules, functional activities, conversational prompts and scripts, others)

Conversation Building

- Timler (2018) reviewed evidence-based assessment and intervention procedures for building conversation
- Conversation Club (Mueller, 2016), now published by AAPC, uses visual stories and engaging characters to demonstrate positive conversational behaviors such as orienting to topics and asking questions
- PEERS curriculum (available via training @ UCLA, commercial manuals) supported by a number of studies, focuses on conversational behaviors and catchphrases (trading information)
- See Social Thinking® for supporting resources (Think Social book is particularly useful around conversation)
- Toontastic can be used to model/self-model conversation behaviors along with…

PLOTAGON STORY FEATURES

- Animation creator with wide selection of characters and settings
- Type a "script" of dialogue and body language between characters
- Sharable to app's website
- Free for iOS/Android/Mac/PC, some settings ("scenes") for purchase
- Clinical Use: Focus on dialogue aspect of storytelling, how narrative unfolds from what characters are saying and thinking. Easier to proceed at a slow pace. Also useful for building conversational language.

ALIGNING APPS WITH RESEARCH-BASED PRACTICES

- Meta-analysis (Bellini & Akullian, 2007) of studies of video modeling (VM) and video self-modeling (VSM, includes family, peer, or self): integrates effective learning modality (visually cued instruction) with "well-studied intervention technique" (modeling)
- 23 peer reviewed studies supported the method as evidence-based, promoting learning factors such as attention, motivation, maintenance.
- Video feedforward- category of VSM in which "hidden support" or prompt is edited out. Comment on the technical expertise required to edit the video footage- not so much a factor anymore?
- Suggestion to use storyboard or script, then record child engaging in desired behavior.

iMovie (Free for iOS devices) provides a simple venue for shooting and editing video modeling supports

Find more information

- ASHA Evidence Maps feature many systematic reviews and meta-analyses
- Subscribe to The Informed SLP, also has free areas of the website
- Be in tune with edtech resources: Talking with Tech podcast, Free Tech for Teachers, Learning in Hand, Larry Ferlazzo's Websites of the Day

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