Incorporating Technology Into Applied Behavior Analysis Interventions

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Technology in Today's Society

- Technology has changed virtually every aspect of our society over the past few decades…from the way we work to the way we socialize, and everything in between.
  - Continuously making advancements & being updated every day
- Children are using technology in more situations & settings than ever.
  - Home, school, community
  - At earlier ages than ever

Medium.com

Technology & Applied Behavior Analysis

▶ Today, we are going to focus on how technology can be incorporated into ABA interventions to promote learning in school, home, or community settings.

▶ Research in the field of ABA shows us that electronic devices:

  ▶ have been recently integrated into educational curricula

  ▶ have been used to teach students of a variety of ages and diagnoses

  ▶ have been used to help teach social, play, leisure, academic, vocational skills, daily living skills… & more

Advantages of Using Technology Within ABA Interventions

▶ Benefits of using electronic devices in educational settings:

  ▶ Portable

    ▶ Can be used across several settings

  ▶ Practical

    ▶ Easier to manage and create/set-up than more "traditional" formats of ABA teaching materials

  ▶ Socially acceptable

    ▶ Just about everyone uses technology these days!

    ▶ More traditional formats may "stand out" or be socially stigmatizing

(Blood, Johnson, Ridenour, Simmons, & Crouch, 2011)

Advantages of Using Technology Within ABA Interventions

▶ Some studies have shown that electronic devices:

   ▶ effectively reduce prompts made by instructors

      ▶ Promote independence!

   ▶ encourage task engagement, independent work, & schedule following

      ▶ Especially engagement → Many kids just seem to love technology!

(Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider, & Grider, 2009).

… and some Disadvantages

▶ Cost

　▶ Technological formats tend to be more expensive than some traditional formats.

　▶ Depending on the type of electronic device chosen, this has gotten a little more affordable…

　▶ …but still more expensive than say, Velcro & a clipboard.

… and some Disadvantages

▶ Practicality

  ▶ Yes, generally electronic formats require less set-up… but some still require a decent amount.

  ▶ Example:

    ▶ Electronic Communication Systems & Activity Schedules

    ▶ Some come with templates & settings that are preloaded and ready to go… but to individualize for a student can take time & effort.

... and some Disadvantages

► Electronic "glitches & bugs"

  ► Need to make sure you have most updated versions available

  ► Charging batteries → traditional formats don't "die"

  ► Remember to back-up!

Behavior Analytical Research

▶ Technology has been incorporated into a variety of interventions & teaching procedures:

  ▶ Communication systems

  ▶ Reinforcement systems

  ▶ Discrete Trial Teaching (DTT)

  ▶ Social Stories

  ▶ Visual prompts (e.g., digital timers)

  ▶ Audio prompts (e.g., recorded audio directions)

  ▶ Activity Schedules

  ▶ Video Models

Technology & Communication

▶ Research shows that electronic devices have been successfully used to teach communication skills to individuals with autism.

▶ Can be used as an alternative to PECS/picture systems or some Augmentative and Alternative Communication (AAC) devices
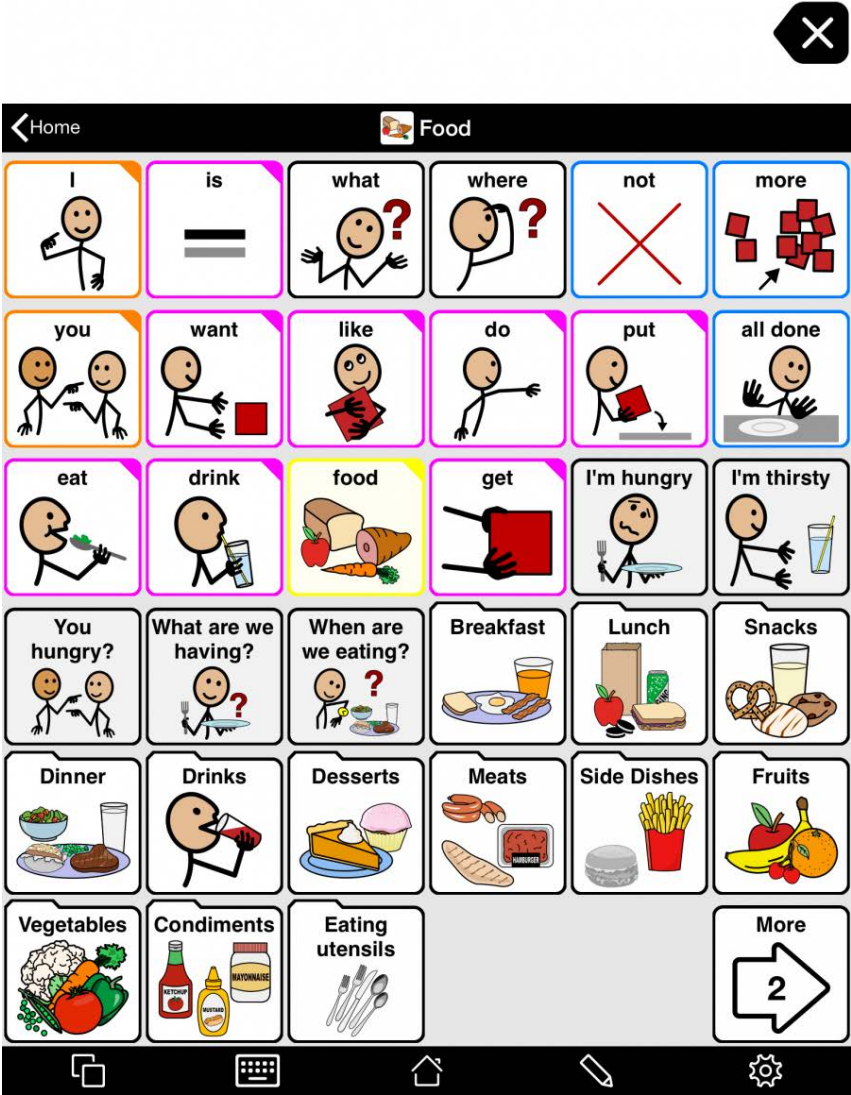
Technology & Communication

▶ Proloquo2Go

  ▶ Well known assistive communication app on the iPad

  ▶ One of the priciest (approximately $200)

  ▶ Generally, easy to set up and use

  ▶ Easy for individuals with special needs to navigate through the menus

  ▶ Provides natural sounding text-to-speech voices, high resolution up-to-date symbols, & a default vocabulary of over 7,000 items

iTunes.apple.com

- Talking strip (optional)
- Templates:
  - Pre-loaded "templates" or vocabularies
  - Blank templates that are completely customizable
- Visually similar to PECS
  - Pictures/clipart
  - Photos
- Menus
  - Folders
  - Buttons
- Customizable colors, fonts, backgrounds, labels, etc.
- Customize complexity of language
- Provides verbal model for student to imitate
  - Modify volume, voice tone, & pace of speech of verbal model

iTunes.apple.com
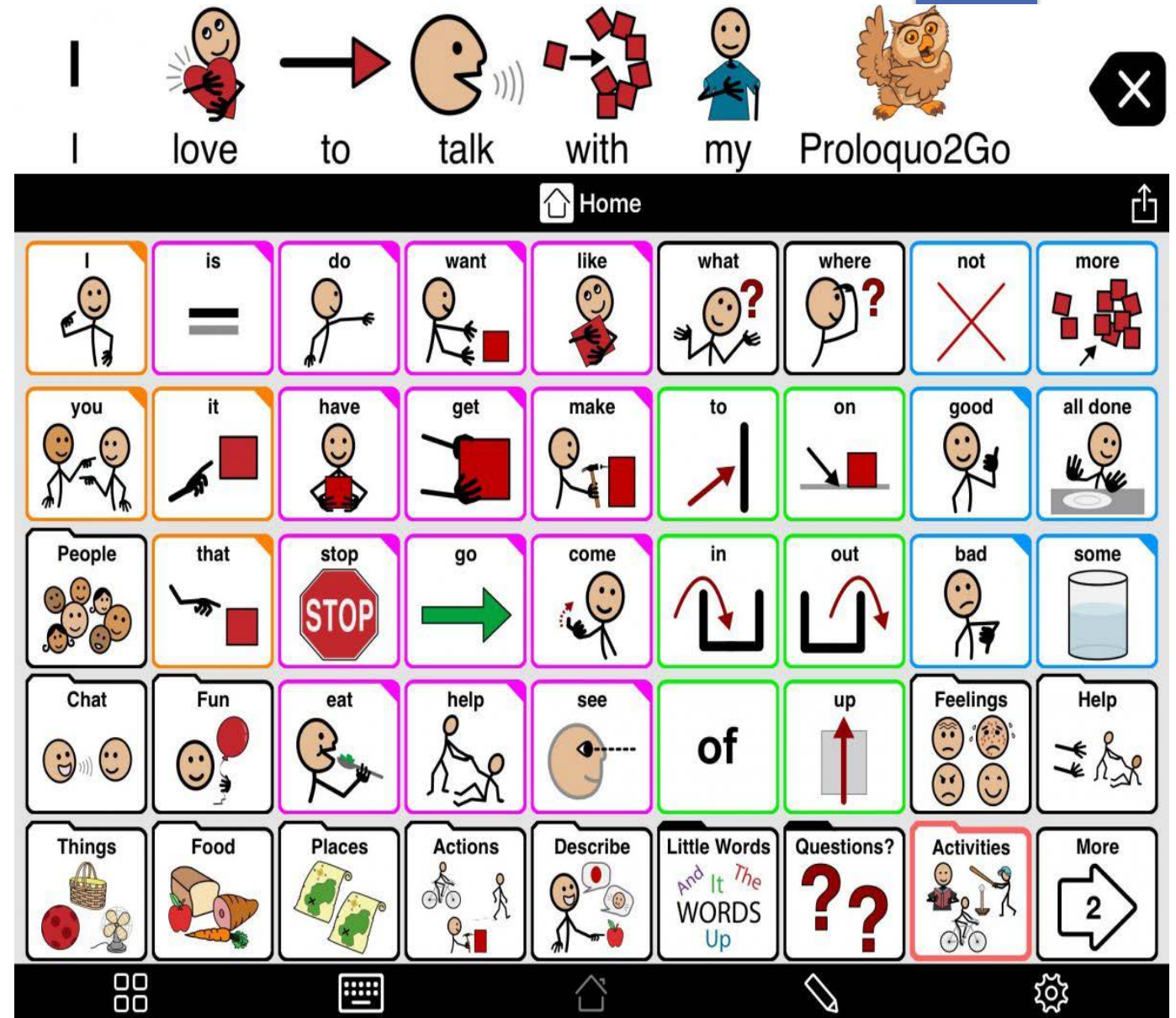
Examples of Menus: Folders & Buttons

iTunes.apple.com

Example of Customized Proloquo2Go with Photos

iTunes.apple.com

Example of Customized Proloquo2Go with Photos

iTunes.apple.com

Comparison

Electronic Version

Tangible Version

Other Popular Versions

iComm   **MyTalk**   **Voice4U**   **Look2Learn**   **iCommunicate**

iTunes.apple.com

Technology & Reinforcement

▶ Positive Reinforcement:

  ▶ "Rewards"

  ▶ Examples: cookies, candy, praise, tokens, TECHNOLOGY

  ▶ Many kids love technology, including iPads, tablets, iPods/music, YouTube, social media platforms, & more!

  ▶ Technology can be incorporated into interventions as the reward itself... OR as a way to deliver positive reinforcement.

Technology & Reinforcement Systems

▶ Reinforcement Systems & Token Economies:

   ▶ Token Economy: A system whereby a person earns generalized conditioned reinforcers (e.g., tokens, chips, points) as an immediate consequence for specific behaviors

   ▶ Tokens are accumulated and are later exchanged for items and activities from a menu of backup reinforcers.

   ▶ "Token systems" or "Token boards" or "Behavior charts"

(Cooper, Heron, & Heward, 2007)

Technology & Reinforcement Systems

▶ iReward is an electronic version of a token economy.

▶ iReward allows the user to choose:

    ▶ the behavior they want to reinforce

    ▶ the reward the wish to designate for that behavior

    ▶ the number of tokens needed to be earned before exchanging for the reward

▶ Can be used on iPads, iPhones, & iPods

▶ About $5.00 to download

iReward

iTunes.apple.com
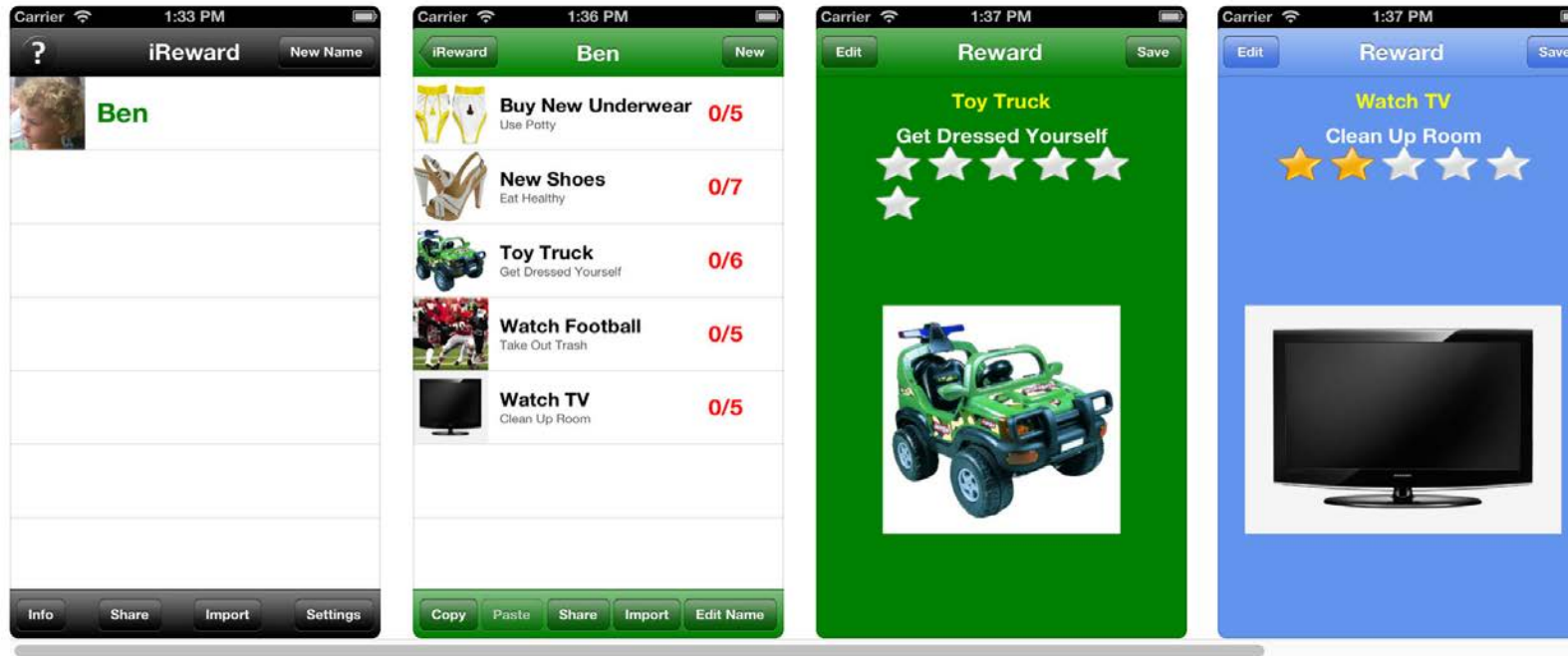
- ▶ Can set up more than one user
  - ▶ Different children
  - ▶ Different settings (e.g., Ben: Home, Ben: School, Ben: Dentist) → different behaviors expected & rewards available
- ▶ Create a list of reinforcers (or rewards) and target behaviors or goals
  - ▶ Can have names of items, pictures, or both
  - ▶ Can upload pictures from "search", or snap & upload your own photos as rewards
- ▶ Lists the numbers of tokens required/currently earned → can be working towards more than one reward at a time!

iTunes.apple.com

- Can include audio stimuli
  - voice recordings
  - token chimes
- Can customize the number of tokens
- Can change format pictures
- Can customize the format of tokens
- Customize background color

iTunes.apple.com
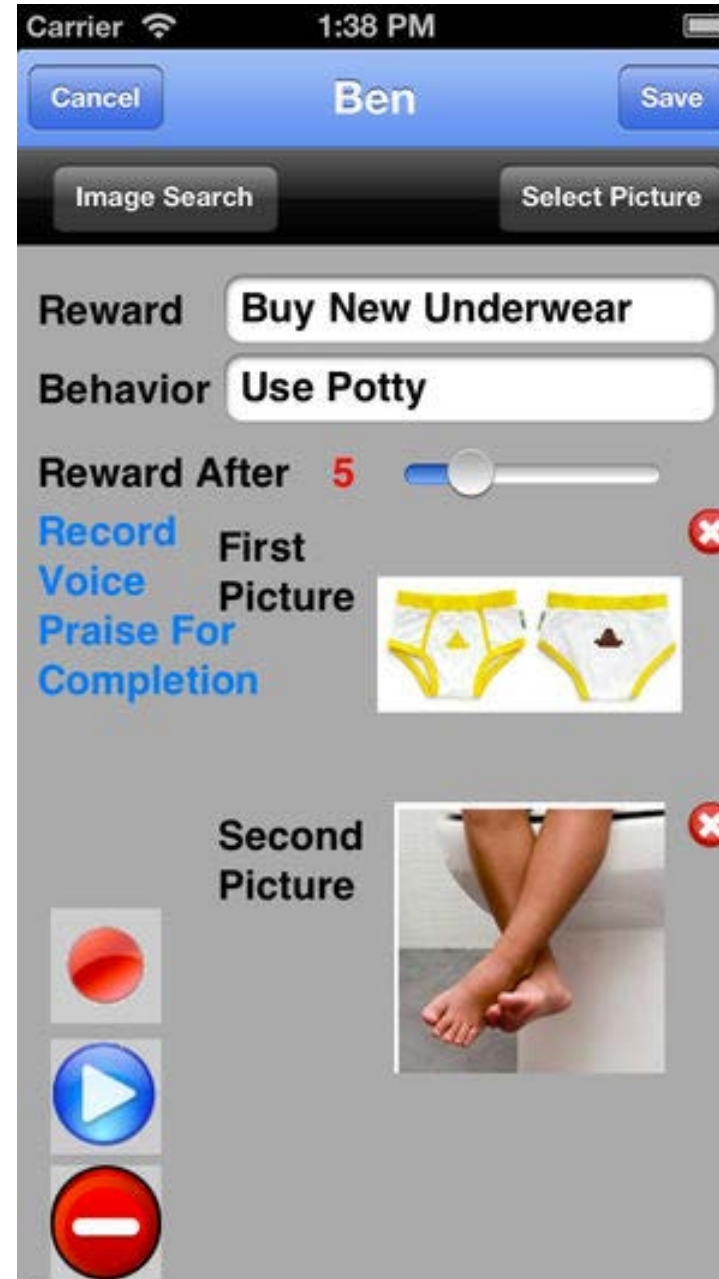
Comparison

Electronic Version

Tangible Version
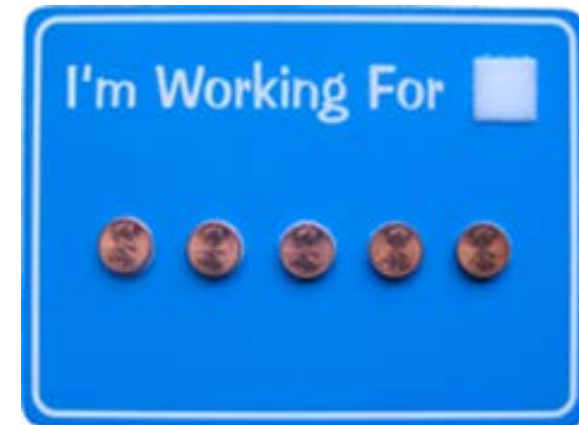
Other Popular Versions
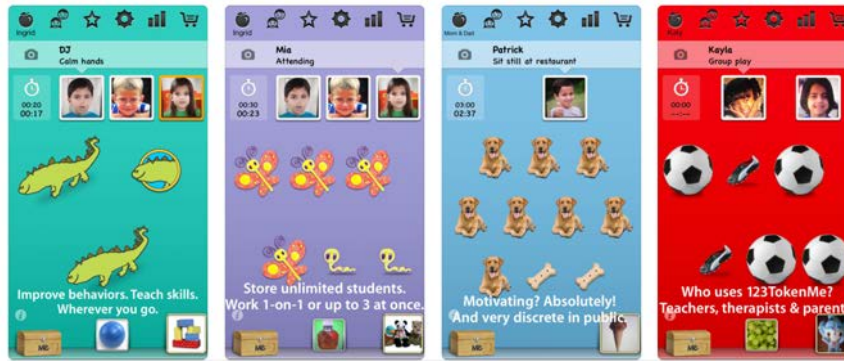
123 Token Me

My Token Board

iTunes.apple.com

Technology & Assessment/Measurement Procedures

▶ More and more, professionals in the field of technology and behavior analysis are teaming up to create software that allows for electronic versions of:

   ▶ Conducting and scoring assessments

   ▶ Creating and individualizing lesson plans & curricula

   ▶ Collecting data & graphing

   ▶ Evaluating and reporting progress

Technology & Assessment/Measurement Procedures

▶ ACE: ABA Software System

 ▶ Developed at the New England Center for Children (NECC)

 ▶ Includes:

  ▶ Curriculum/Lesson Bank

   ▶ Communication, social skills, academics, self-help, discrimination, health & safety, recreation & physical education, community, vocational and transition lesson plans

   ▶ Templates available through lesson bank → don't have to write them from scratch, but are completely customizable

ACE 4.0

http://www.acenecc.org/about-the-ace/

Technology & Assessment/Measurement Procedures

▶ Also includes:

▶ Data Collection & Graphing

▶ Don't need to use paper & pencil data collection → data collection app

▶ Automatically graphs the data

▶ Can automatically generate progress reports & other reports representing the data

▶ Assessments

▶ Online educational and skills assessments that can be completed

▶ Instructor inputs results and then receives instant recommendations for goals & objectives based on ACE curriculum

▶ VB-MAPP and Core Curriculum Standards

ACE 4.0

http://www.acenecc.org/about-the-ace/

ACE Apps

- Broken down by category

- Available on phones, tablets, computers, etc.
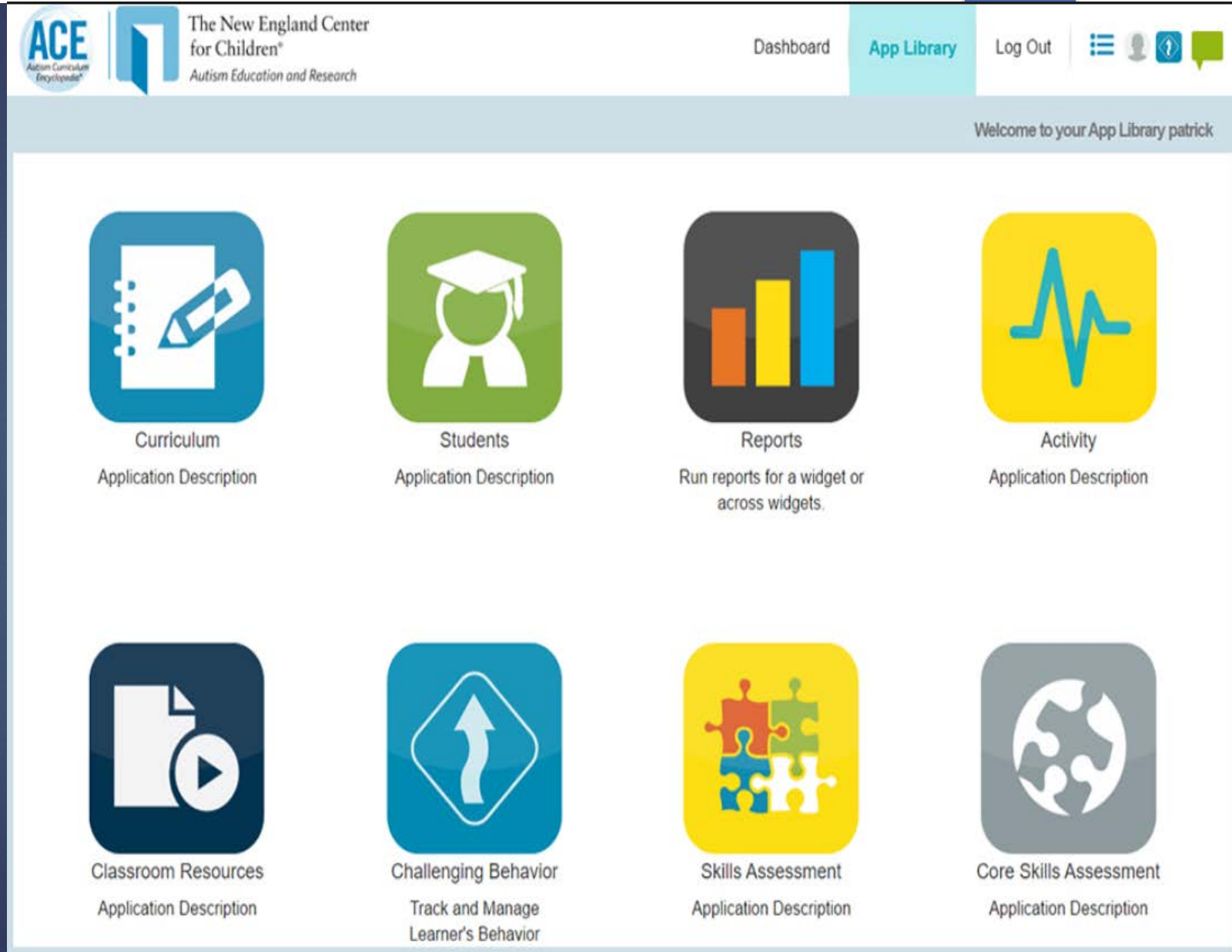
ACE

- Enter data online
- Manage lesson → edit/customize for individual learner
- Tables summarizing progress to date
- Tallies of how often the lesson has been taught

http://www.acenecc.org/about-the-ace/

ACE

- After inputting data, automatically graphs progress
- List instructional targets and types of prompts used
- Prescribes prompt fading steps
  - Helps ensure consistency

http://www.acenecc.org/about-the-ace/

Other Popular Versions

Catalyst

Behavior Tracker Pro

Autism Tracker Pro

iTunes.apple.com

Technology & Teaching Procedures

▶ Technology allows for new, creative methods of delivering instructions or providing prompts within teaching procedures.

  ▶ Visual

    ▶ Digital timers

  ▶ Audio

    ▶ Recorded directions played aloud or via headphones

  ▶ Can help promote independence

  ▶ Allows instructors to fade distance

Examples of Visual Timers

Time Left in Activity
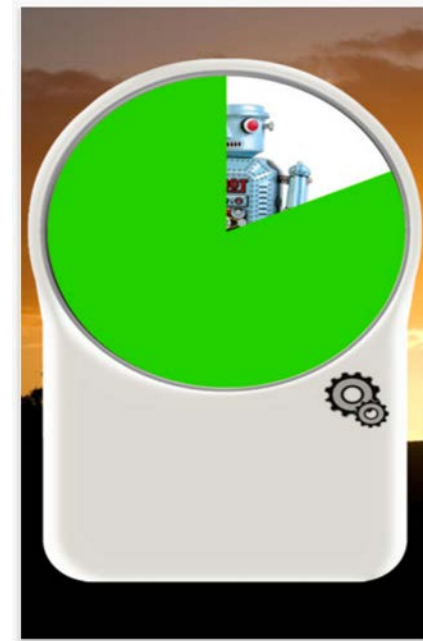
**Time Remaining Until Activity Begins or
Time Remaining Until Cleaning Up Activity**

Examples
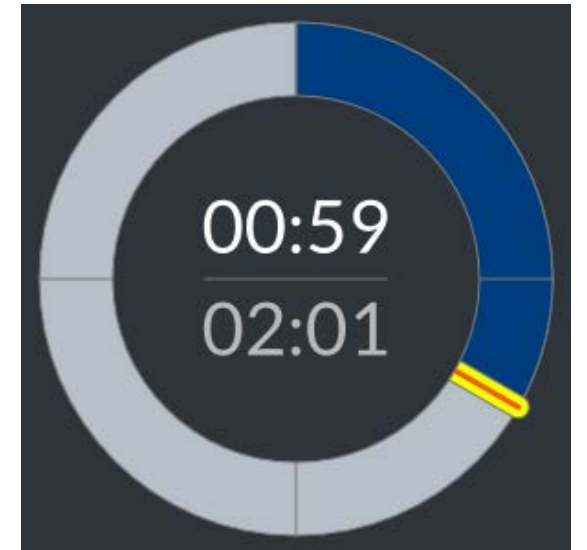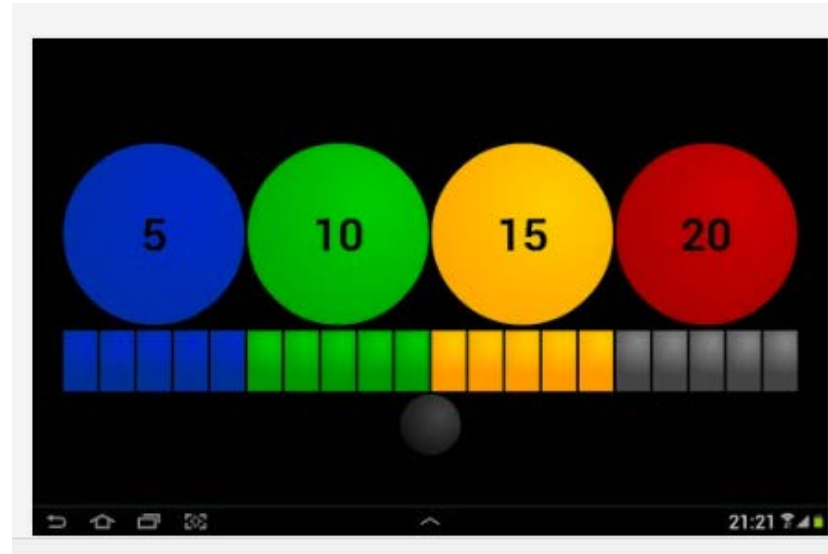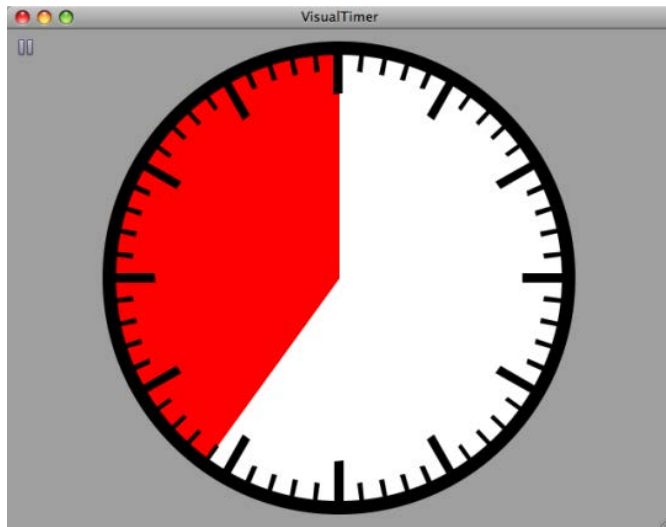
Can be selected based on learner's skill set

Technology & Discrete Trial Training

▶ Discrete Trial Training:

  ▶ A very systematic and methodical way of teaching that makes instruction very clear to the student

  ▶ Breaks tasks down into small (discrete) pieces

  ▶ Uses reinforcement procedures so that the student systematically learns the skill

▶ Now with advanced technology, DTT apps exist that target a wide range of skills.

  ▶ Academic

  ▶ Language

  ▶ Social

  ▶ & more

http://www.educateautism.com/applied-behaviour-analysis/discrete-trial-training.html

Technology & Discrete Trial Training

▶ **Dr. Gary Brown's Autism/DTT Letters app**

  ▶ Identification of letters of the alphabet & the difference between uppercase and lowercase letters

▶ **Dr. Gary Brown's Autism/DTT Numbers app**

  ▶ Identification of numbers (0-99) and to learn to count (0-9)

▶ **Picture ID: See.Touch.Learn**

  ▶ Identification of expressive and receptive pictures
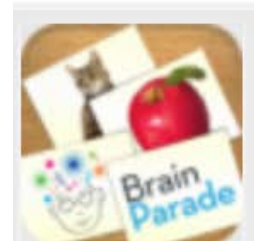
▶ **Replace more traditional ways of DTT that use tangible picture cards**

iTunes.apple.com

Technology & Social Stories

- **Social Stories**

  - Help individuals understand social situations and give them tools to respond correctly to their environment

  - Help the individual visualize what to do using pictures and text

  - These apps allow you to create your own stories with own personal photos for any situation.

  - Teaches:
    - Conversational skills
    - Memory recall and event recollection
    - Receptive & expressive labeling
    - Proper behavior in a social situation
    - Answering Questions/Comprehension…& more!

iTunes.apple.com

Comparison

Electronic Version
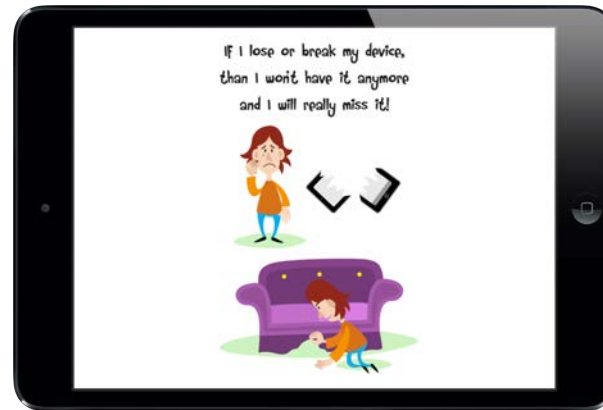
Tangible Version
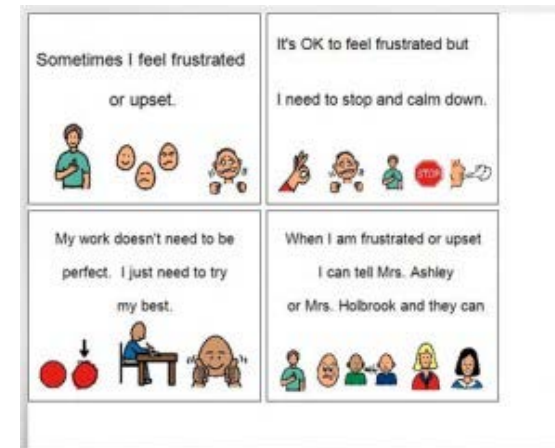
Technology & Activity Schedules

▶ **Activity Schedule**

▶ A visual schedule comprised of pictures and/or words that:

   ▶ Show the sequence of steps needed to complete an activity

   ▶ List occurrences of daily events (daily routines)

   ▶ Provides structure for unstructured downtime (play or leisure)

▶ Can be pictures only, text only, or pictures & text depending on the learner's skills

(McClannahan & Krantz, 1998; Bryan & Gast, 2000; Dooley, 2001)

Technology & Activity Schedules

▶ Can be used to:

  ▶ Increase on-task behavior

  ▶ Decrease inappropriate or challenging behavior

  ▶ Facilitate smooth transitions

  ▶ Enhance skill acquisition

  ▶ Increase independence

  ▶ Promote self-management

(McClannahan & Krantz, 1998; Bryan & Gast, 2000; Dooley, 2001)

Technology & Activity Schedules

▶ **First-Then Visual Schedule**

   ▶ Electronic version of activity schedule that provides visual support

   ▶ Can be used to increase independence and provide structure during transitions through different activities

   ▶ Can be used to help students navigate long behavior chains

      ▶ Break skill down into smaller components

   ▶ Can be used on iPhones, iPods, iPads, etc.

   ▶ Fully customizable

iTunes.apple.com

- ▶ Can use your own photos or add photos from the built in Internet image search feature
- ▶ Can record your own voice to the images
- ▶ Can create more than one schedule at a time
- ▶ Can change the order of schedules at any time
- ▶ Has three different formats that can be adjusted for the skills of the learner (full screen, first-then screen, list screen)
- ▶ Can add checklist feature to visually show completion of steps
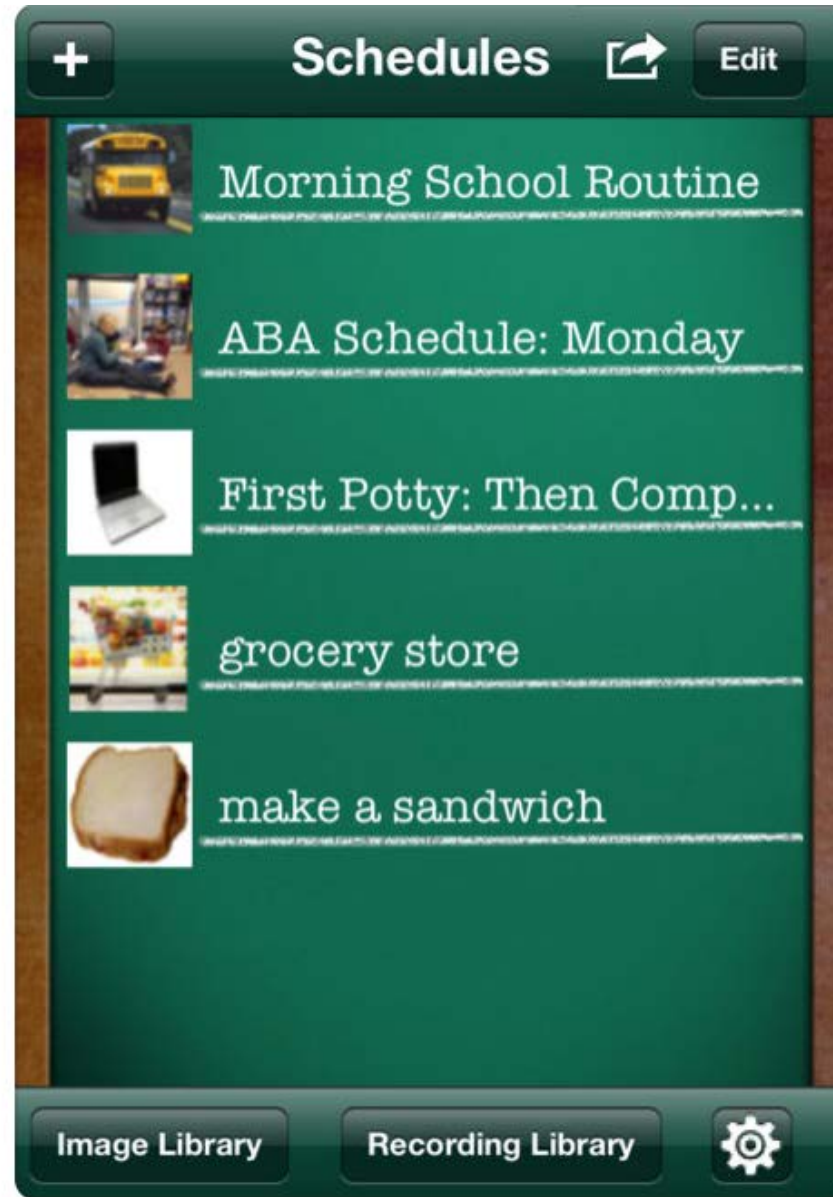
List of different schedules for daily routines and activities

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"List screen" with check marks for completed tasks

Example of broken down steps for long behavior chain

iTunes.apple.com

"First-then screen" with check marks for completed tasks

Bigger, more detailed pictures

Learner sees fewer pictures at a time to help them focus on current step

Slides through as they are completed

Also "full screen" option
→ 1 step at a time

iTunes.apple.com

Comparison

Electronic Version

Tangible Version
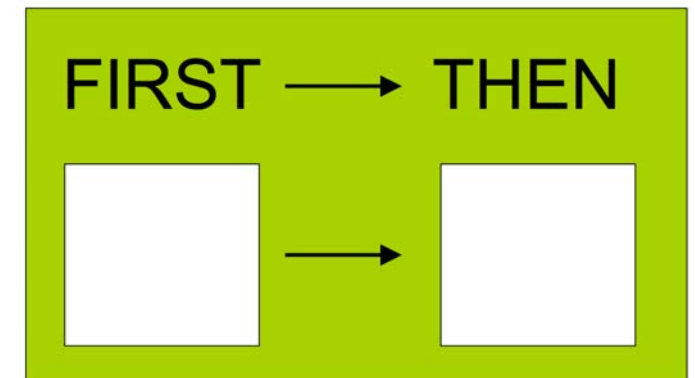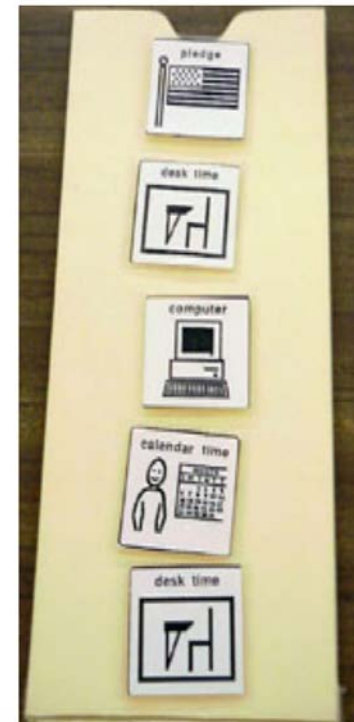
Other Popular Versions

iPrompts
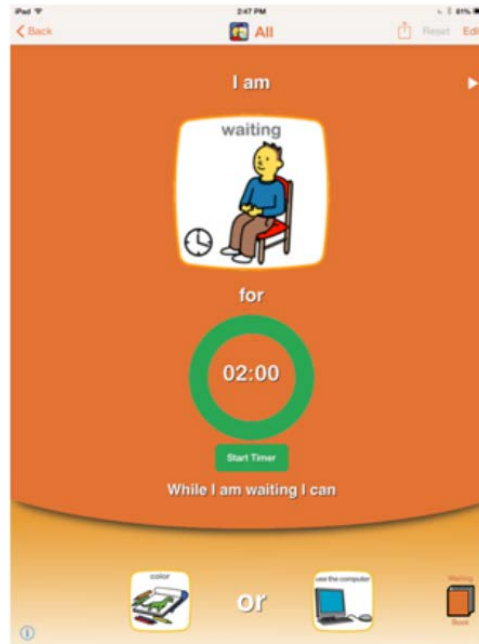
ChoiceWorks

**What's Next
(Visual Prompts)**

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Technology & Video Modeling

▶ **Video Modeling**

  ▶ Mode of teaching that uses video recording and display equipment to provide a visual model of the targeted behavior or skill

  ▶ The learner watches a video of someone performing a desired behavior or skill, and then imitates the behavior or skill.

(Franzone, & Collet-Klingenberg, 2008)

Video Modeling

► Video Models have been used effectively to teach:

- ► Vocational and self-help skills (Van Laarhoven, et al., 2009)

- ► Transition skills (Cihak, Fahrenkrog, Ayres, & Smith, 2010)

- ► Leisure skills (e.g., watching videos, listening to music) (Kagohara (2011; Kagohara, et al., (2011)

- ► Academics (e.g., reading numbers, writing numbers, spelling words) (Jowett, Moore, and Anderson, 2012; Kagohara, et al., 2012)

- ► Play skills and play-related conversation skills (Murdock, et al., 2013)

- ► And more!

Types of Video Modeling

▶ There are various types of video models that can be used.

▶ Differences lie in:

  ▶ The perspective of the video (e.g., third-person, first-person/point-of-view)

  ▶ The characteristics of the person modeling the behavior

    ▶ Peers? Adults? The learner himself/herself?

    ▶ Is the model familiar or unfamiliar to the learner?

(Franzone, & Collet-Klingenberg, 2008)

Types of Video Modeling

▶Basic video modeling

▶Video self-modeling

▶Point-of-view video modeling

▶Video prompting

(Franzone, & Collet-Klingenberg, 2008)

Types of Video Modeling

▶ Basic video modeling:

  ▶ Records <u>someone besides the learner</u> engaging in the target behavior or skill

  ▶ The video is then viewed by the learner at a later time

  ▶ The learner watches the video first (sometimes more than once), and then performs the skill

  ▶ Third person perspective

  ▶ Model can be adults, peers, siblings, etc.

(Franzone, & Collet-Klingenberg, 2008)

Types of Video Modeling

▶ Video self-modeling:

    ▶ Records <u>the learner</u> engaging in the target behavior or skill

    ▶ The video is then viewed by the learner at a later time

    ▶ The learner watches the video first (sometimes more than once), and then performs the skill

    ▶ Third person perspective

    ▶ <u>Model is the learner himself/herself</u>!

(Franzone, & Collet-Klingenberg, 2008)

Example of Basic Video Modeling

▶ Target behavior: Tying a shoe

▶ Third-person perspective

▶ Peer acting as the model

  ▶ Note: If the boy in this video (who acted as the model) then used this video to tie his shoes, it would be considered video self-modeling.

▶ https://www.youtube.com/watch?v=4NjEFg4lCIA

Example of Basic Video Modeling

▶ Target behavior: Building a block tower

▶ Third-person perspective

▶ Peer acting as the model

  ▶ Note: If the girl in this video (who acted as the model) then used this video to build a tower, it would be considered video self-modeling.

▶ https://www.youtube.com/watch?v=mMMUdG0h2G0

Types of Video Modeling

▶ Point-of-view video modeling:

  ▶ The target behavior or skill is recorded from the <u>perspective of the learner.</u>

  ▶ The video is then viewed by the learner at a later time.

  ▶ The learner watches the video first (sometimes more than once), and then performs the skill.

  ▶ First-person point of view

    ▶ Filmed from the eye level of the learner

    ▶ Typically only show arms or hands of the person modeling the behavior

▶ Models can be adults, peers, siblings, or the learner himself/herself.

(Franzone, & Collet-Klingenberg, 2008)

Example of Point-of-View Video Modeling

▶ Target behavior: Tying a shoe

▶ First-person perspective

▶ Model could be an adult, peer, sibling, or the learner

▶ https://www.youtube.com/watch?v=JL63-69f0Sw

Example of Point-of-View Video Modeling

▶ Target behavior: Building a block tower

▶ First-person perspective

▶ Model could be an adult, peer, sibling, or the learner

▶ https://www.youtube.com/watch?v=7HYeVDGtDMc

Types of Video Modeling

▶ Video Prompting:

    ▶ Breaks the behavior or skill into steps and records each step with incorporated pauses during which the learner may attempt the step before viewing subsequent steps

    ▶ <u>The learner watches the video as he/she goes along performing the skill.</u>

        ▶ That is, they watch the video as they imitate/perform the skill.

(Franzone, & Collet-Klingenberg, 2008)

Video Models

▶ We use video models all the time!

    ▶ Cooking shows

    ▶ Work-out videos

    ▶ How-To instructional videos on YouTube

▶ Depending on the skill set of the learner, the type of skill you are teaching, and the equipment you have available:

    ▶ YouTube is a great resource for pre-made videos (if you monitor the skills modeled to ensure it is exactly what you are looking for/appropriate for the learner)

    ▶ Relatively easy to make your own with iPhones or iPad cameras

THANK YOU!

Questions? Comments?