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
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!
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
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.
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
- 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
Examples of Menus: Folders & Buttons
Example of Customized Proloquo2Go with Photos
Example of Customized Proloquo2Go with Photos
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.
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)
iReward is an electronic version of a token economy.

- iReward allows the user to choose:
  - the behavior they want to reinforce
  - the reward they 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

iTunes.apple.com
- Can set up more than one user
  - Different children
  - Different settings (e.g., Ben: Home, Ben: School, Ben: Dentist) \(\rightarrow\) 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 \(\rightarrow\) can be working towards more than one reward at a time!
• 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
Comparison

Electronic Version

Tangible Version
Other Popular Versions

123 Token Me

My Token Board

iTunes.apple.com
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
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

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.

http://www.acenecc.org/about-the-ace/
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.acenec.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 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
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
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
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 your 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
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)
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
- 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.

iTunes.apple.com
“List screen” with check marks for completed tasks

Example of broken down steps for long behavior chain

- turn water on
- scrub hands
- get soap
- rinse hands under
“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
Comparison

Electronic Version

- turn water on
- scrub hands
- get soap
- rinse hands under...

Tangible Version

FIRST → THEN
Other Popular Versions

iPrompts
ChoiceWorks
What’s Next (Visual Prompts)

iTunes.apple.com
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 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!
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 someone besides the learner 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 the learner 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 is the learner himself/herself!

(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](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](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 perspective of the learner.
  - 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](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.
- The learner watches the video as he/she goes along performing the skill. 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?