



# Faster than a Speeding Bullet: iPads in Autism Intervention

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**Saturday, March 10, 2018**

**Simon Fraser University - Harbour Centre**

*Presented by*

**Brenda Fossett, PhD, BCBA-D**

**Capilano University**

**Applied Behavior Analysis – Autism Department**

*Co-Sponsored by*

*Simon Fraser University*

# *Event Schedule*

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<b>8:30 – 9:00</b>	Registration
<b>9:00 – 10:15</b>	Session 1
<b>10:15 – 10:30</b>	Morning break (refreshments will be provided)
<b>10:30 – 12:00</b>	Session 2
<b>12:00 – 1:00</b>	Lunch (bring or buy)
<b>1:00 – 2:15</b>	Session 3
<b>2:15 – 2:30</b>	Afternoon break (refreshments will be provided)
<b>2:30 – 3:30</b>	Session 4

## **Reminders:**

- **Please turn off your cell phones or put them on vibrate.**
- **In respect for the speakers and fellow participants, please do not whisper.**
- **Recording of any kind is not permitted.**
- **Please secure your belongings! ACT cannot take responsibility for theft.**
- **Many of your fellow participants require a scent-free environment.**

# Acknowledgements

ACT – Autism Community Training deeply appreciates the many parents and professionals across British Columbia who volunteer their time to support our work. ACT’s volunteers range from parents and community groups, who advise us on venues and speakers, to members of our Advisory Council and Board of Directors, who provide a range of expertise, as well as those who volunteer at our events. Their contributions are all essential to enabling ACT to continue our work.

Special thanks to our speaker, Dr. Brenda Fossett, for presenting this workshop on a topic that is of great interest to families and professionals.

We also acknowledge Simon Fraser University’s Autism Lab, and Dr. Grace Iarocci, for continuing to support ACT’s work through making SFU’s excellent facilities at Harbour Centre available.

As a not-for-profit society, funds generated by ACT’s live events remain in B.C. and are reinvested in new initiatives.

## Free Resources from ACT

**Autism Videos @ ACT (AVA)** - nearly 30 quality online videos available free – without a log-in, thanks to our sponsors. [www.actcommunity.ca/videos](http://www.actcommunity.ca/videos)

**ACT’s Autism Information Database (the AID)** – Like Google for Autism but better! Keyword search nearly 1300 curated AID records for evidence-informed, practical information resources useful to families and community professionals. [www.actcommunity.ca/aid](http://www.actcommunity.ca/aid)


**ACT’s BC Community Resources Database** – search by your postal code for professionals and service providers throughout BC: [www.actcommunity.ca/aid-search/community/](http://www.actcommunity.ca/aid-search/community/)

**ACT’s Autism Manual for B.C** – 13 chapters! [www.actcommunity.ca/autism-manual-for-bc](http://www.actcommunity.ca/autism-manual-for-bc) - including *Guide to Employment for Teens and Adults with Autism in B.C.* & *Guide to Working with South Asian Families Affected by Autism*

**ACT’s Monthly News Round-Up & Event Alerts** - sign-up to keep in touch with developments affecting the special needs community [www.actcommunity.ca/updates](http://www.actcommunity.ca/updates)

*Faster Than a Speeding Bullet:*  
iPads in Autism Intervention

Brenda Fossett, Ph.D., BCBA-D  
Capilano University  
March 10, 2018



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### Technology Use

<b>Research Focus:</b> <ul style="list-style-type: none"><li>• Device access<ul style="list-style-type: none"><li>- Turn on/off the device</li><li>- Locate and select app</li><li>- Listen to music</li><li>- Watch videos</li><li>- Look at photos</li></ul></li></ul>	<b>Instructional Strategies:</b> <ul style="list-style-type: none"><li>• Video modeling</li><li>• Task analysis and total task chaining</li><li>• Least to most prompting hierarchy</li><li>• Embedded reinforcement in the task<ul style="list-style-type: none"><li>- Access to movies, music, photos</li></ul></li></ul>
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### Teaching Technology Use

- Additional skills can be addressed through the use of apps:
  - Cause and effect
  - Gestures
- Apps can be used as a way for individuals to explore and/or practice ways in which devices are activated
- Many of these apps can be used to target specific fine motor skills

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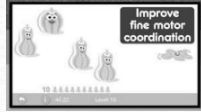
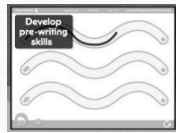
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### Apps to Teach iPad Use

- Dexterity (\$6.99) and Dexterity, Jr. (\$5.49)



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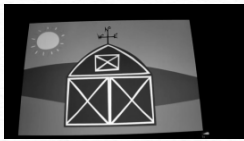
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### Apps to Teach iPad Use

- Peekaboo Barn, Lite/\$2.79

Uncolor, \$1.39



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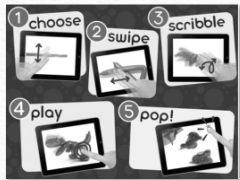
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### Apps to Teach iPad Use

Balloonimals, \$2.79

Elmo's Monster Maker, \$3.99



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### iPads to Address Communication Skills

- Three primary areas of focus:
  - Speech and Language
  - Visual Scheduling
  - Augmentative and Alternative Communication

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### iPads to Teach Speech and Language Skills

#### Research Focus:

- Play dialogue
- Eye contact
- Vocabulary
- Giving compliments
- Speech production

#### Instructional Strategies:

- Social Stories™ or story-based interventions
- Video modeling
- Visual scripts
- Prompting
- Speech generating device (SGD)

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### Teaching Speech and Language Skills

- Research has focused specifically on the use of iPads as a *tool* for teaching specific speech and language skills
- Apps are available to address some speech and language skill areas
  - Little to no research to support the use of specific apps
  - Use apps as an instructional *tool*, just as you would use other tools (e.g., flashcards, picture books, etc.)
- Apps can enhance instruction in the area of speech and language
  - Intended to be used primarily during instructional activities *with an adult* or as supplemental practice once a skill has been acquired

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## Apps to Address Speech and Language

- There are apps to address:
  - Vocabulary
  - Receptive identification
  - General speech and language



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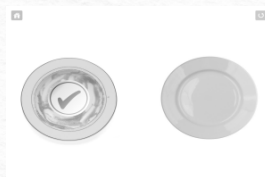
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## Apps for Speech and Language

Farm Animals by Photo Touch, Free

Comparative Adjectives, \$1.39



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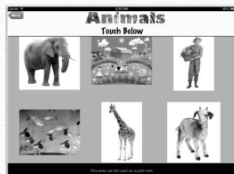
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## Apps for Speech and Language

Discrete Trial Training Apps



- Autism DTT Pro: \$54.99
- Individual apps range in price from \$2.79 - \$10.99
  - Numbers
  - Letters
  - Shapes
  - Words
  - Colors
  - People
  - Animals

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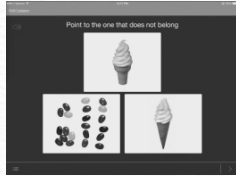
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## Apps for Speech and Language

See Touch Learn Pro, \$23.99



Speech with Milo Apps

- Range in price from \$3.99 to \$32.99
- Address a number of skills:
  - Sequencing
  - Nouns
  - Verbs
  - Prepositions
  - Adjectives
  - Articulation



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## Apps for Speech and Language

Mobile Education Store Apps

- Range in price from \$6.99 to \$22.99
  - Sentence Builder
  - Sentence Builder Teen
  - Language Builder
  - Preposition Builder
  - Preposition Builder Teen
  - Question Builder
  - Story Builder



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## Apps for Speech and Language

Looking for Words, Lite/\$11.99

- Teaches functional vocabulary with speech and text
- Ability to personalize words displayed
- Tracks student data



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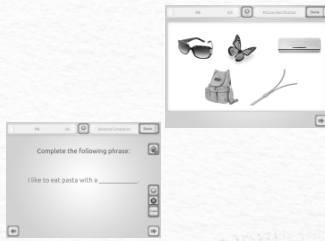
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## Apps for Speech and Language

Language Trainer, \$16.99

- Picture Identification
- Picture Naming
- Divergent Naming
  - E.g., "Name 5 chores in your house."
- Sentence completion



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## iPads to Support Visual Scheduling

Research Focus:

- Transitions
- Self-management
- Independence
- Task completion

Instructional Strategies:

- Picture-based schedules
- Picture-based schedules with embedded video prompts or video models

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## Apps for Visual Scheduling

First Then Visual Schedule HD, \$20.99

iPrompts, \$69.99; \$139.99 (Pro)



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## Apps for Visual Scheduling

Choiceworks, \$9.99



Choiceworks Calendar, \$6.99



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## Apps for Visual Scheduling

Visual Schedule Planner, \$20.99



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## iPads for AAC

### Research Focus:

- Comparison of tablet-based AAC systems with other modalities
  - Manual sign
  - Picture-based (non-technological)
- Acquisition of communication skills via AAC
  - Requesting
  - Commenting
  - Social conversation

### Instructional Strategies:

- Behavior analytic instructional strategies
  - Discrete Trial Teaching
  - Errorless instruction
  - Prompting and systematic fading of prompts
  - Time delay
  - Within stimulus prompting
  - Shaping
  - Reinforcement

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## Teaching Communication Using AAC Apps

- Select an appropriate AAC app
  - Grid-based, scene-based, or combined
  - Type of symbol set (line drawings, photographs)
  - Voice output (ability to customize)
  - Size of symbols (can the individual 'hit the target?')
  - Flexibility (can the system 'grow' with the individual?)
  - Consider current skills and needs *and* future needs

*Work with a professional with extensive experience in the area of AAC intervention and AAC apps*

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## Apps for AAC

Scene Speak, \$13.99

- Create visual scene displays
  - Touch images within a scene to speak a message
- Use scenes provided or import your own images
- Create links between scene pages
- Pop up text



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## Apps for AAC

Scene and Heard, \$69.99

- Create visual scene displays
- Core symbol-based vocabulary
- Customize size and placement of 'hot spots'
- Use existing scenes or use your own photos
- Create links between scene pages
- Add video clips



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## Apps for AAC

Snap Scene, \$49.99 (Free Trial)

- Designed for young children, including infants, at early stages of learning to communicate
- Based on research by Dr. Janice Light, designed to increase
  - Initiation of social interactions
  - Sharing information
- Allows for 'Just In Time' programming



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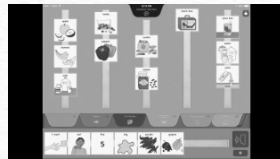
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## Apps for AAC

PECS IV+, \$139.99

- Designed for those who have mastered Phases I-IV of the Picture Exchange Communication System (PECS)
- Designed to look and navigate like a traditional PECS binder
- Up to 20 pages
- Customizable voices; English, Spanish, Japanese, French, German, Greek



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## Apps for AAC

Proloquo2Go, \$349.99

- Dynamic display AAC app
- 14,000 symbols
- Over 30 voices
- Fully customizable
- Typing view with word prediction



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## Apps for AAC

ChatAble, \$139.99

- Choice of displays:
  - Visual scene
  - Grid
  - Hybrid (visual scene with grid)
- 18,000 Picture Communication Symbols
- Weekly visual schedule embedded within app
- Social media integration
- Make Skype calls from within app
- Link to videos, YouTube, music, webpages




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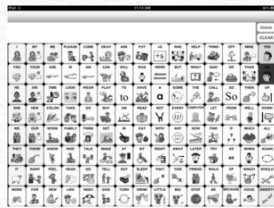
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## Apps for AAC

Speak for Yourself, Lite/\$399.99

- 11,000 symbols
- Customizable – show anywhere from 1 symbol to 14,000 words
  - Add your own images
- Never more than 2 'hits' to access a vocabulary item
- Search feature to locate vocabulary




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## Apps for AAC

Talking Tiles, Contact for Pricing

- Dynamic display AAC
  - Multi-platform, including computers
  - Customize pages on computer and sync to tablet
- 50,000+ images and symbols
- 30+ voices and languages
- Visual scheduling
- Chinese and Spanish pages




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## Apps for AAC

Verbally, Free; \$99.99 for Premium Version

- Text-based AAC with word prediction
- Choice of keyboard layouts
- Core words and core phrases
- Compose in Verbally and send text to email application




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## Summary of Findings: iPads and AAC

- Most participants meet criterion for tablet- and picture-based options; some meet criterion for manual sign
  - Manual sign appears to be the most difficult modality
- Individuals with ASD/DD have preferences regarding AAC modality
  - Most, *but not all*, demonstrate a preference for tablet-based options
- Some participants indicate a preference early and rapidly acquire skills using that modality
  - Others don't demonstrate a preference until they become skillful in a modality

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## Summary of Findings: iPads and AAC

- Success is most often associated with
  - Preference for tablet-based communication
  - Instruction embedded within highly preferred activities
  - Individualized instruction that utilizes behavioral principles
- Most research has focused on teaching requesting (manding) with a small set of vocabulary
  - Need to research instruction for purposes other than requesting
  - Need to research instruction with larger set of vocabulary and multiple pages of vocabulary
  - Need to research assessment strategies to aid in selection of display modes

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### Kasari et al., 2014

- Reported findings of a randomized control trial investigating the impact of SGD use on spoken language in young children with ASD who spoke, on average, fewer than 20 words
  - 6 months of intervention
  - 3 month follow-up
- All children (n=61) received naturalistic behavioral intervention (2 1-hour sessions/week)
  - Half of the children used an iPad with Proloquo2Go during their sessions
  - Poor responders in the non-iPad group received an iPad halfway through the study

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### Kasari et al., 2014

- Main findings
  - Children with iPad outperformed those without
    - Used language socially and spontaneously
    - Engaged in more commenting
  - Children who began treatment with an iPad showed greater improvements compared to those who received an iPad later in treatment
- Findings suggest that it may be beneficial to include SGD as part of naturalistic behavioral interventions from the outset

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### Research on AAC

“Many children with autism have an iPad or other device but do not use it. Perhaps the child has not received sufficient instruction to master it or has not been taught to use it in social communication. Also, children must have partners who are willing to use the device, model how to communicate on it, and keep the device programmed, updated with new words and phrases, and charged and ready for use. And it’s important for an adult to teach and support the child in using the device across settings.”

Ann Kaiser, Vanderbilt Peabody College  
<http://www.vanderbilt.edu/magazines/peabody-reflector/2014/03/me-myself-and-ipad/>

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### Research on Tablet-Based AAC

- In a recent review of the literature, Dr. Pat Mirenda noted

“...it seems premature at this point in time to consider the use of mobile devices for AAC to be evidence-based, except with regard to requesting...[c]ontrary to popular opinion, there is still much work to be done in this most visible of all practice-to-research domains, although the empirical evidence to date is promising.” (2017, p. 39)

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### Choosing AAC Apps

- Boyd et al. (2015) published a paper reviewing considerations for selecting AAC apps for the iPad
  - Ability to customize the app
  - Motor skills requirements to use the app
  - Resources and time required for intervention or instruction
  - Research supporting the application
  - Cost of device and app

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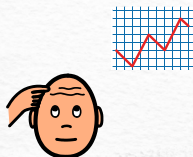
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### Implementing Tablet-Based AAC

- After careful selection of an AAC app, progress must be monitored to determine whether or not the intervention is effective for a given individual
  - Communication goals identified
  - Systematic instruction delivered
  - Measurement of progress
  - Modifications as needed, based on data



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## iPads to Address Behavior

### Research Focus:

- Increase engagement and on-task behavior
- Decrease off-task behavior
- Teach specific behaviors
- Provide reinforcement contingent on desired behaviors

### Instructional Strategies:

- iPad-delivered Social Stories™ or video models
- Prompting
- Prompt fading

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## Using the iPad to Address Behavior

- Instructional iPad apps can provide an alternative to traditional instructional methods or materials
  - Student preference for iPad-based instruction may increase desired behaviors
- Apps can be used to deliver interventions to target problem behavior and/or teach desired behavior
  - Social Stories™, scripts, and video models can be presented on iPad
- Apps for reinforcement

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## Apps for Social Stories™ and Scripts

Pictello, \$27.99

- Create photo and/or video based story or script
- Text is read out loud



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## Apps for Reinforcement

R+ Remind, \$1.39

- Interval timer to remind parents, teachers, BIs, etc. to provide reinforcement
- Choose from 1, 2, 3, 5, 7, 10 and 15 minute intervals
  - Variable intervals
- Sound and/or vibrate to remind adult to deliver reinforcement



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## Apps for Reinforcement

Working 4, \$2.79

- Set number of tokens required
- Set desired reward
- Track progress



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## Apps for Reinforcement

ChoreMonster, Free

- Chores are assigned by parent via their own app or through web app
  - Task
  - Due date and time
  - Points
  - Other rewards
- Child indicates if chore is completed
- Parent approves child report
  - Points/rewards delivered upon approval



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### Summary of Findings: Behavior

- Traditional instructional tasks vs. iPad-based instructional tasks
  - iPad/tablet use during instructional activities does *not* always result in behavioral improvements; recommended to provide choice to students and/or monitor effect on behavior
- Tablet-delivered Social Stories™
  - Improvements in behavior for some, but not all, individuals
- Important to monitor effect of iPad-based interventions on behavior
  - Take data!

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### iPads to Teach Leisure & Play Skills

#### Research Focus:

- Activity schedules to teach leisure skills
  - Structure leisure time
  - Engage in a specific leisure activity (e.g., use iPad, use iPod Touch)
    - Play game
    - Listen to music
    - Watch video
    - Look at photos

#### Instructional Strategies:

- Visual activity schedules
- Prompting
- Fading of prompts
- Generalization training

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### Teaching Leisure & Play Skills

- General apps can be used to provide structure and sequence
  - Visual scheduling apps
  - Pictello
- Individuals can be taught to use specific apps as a leisure activity
  - Angry Birds
  - iTunes
  - YouTube

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## Apps for Leisure & Play Skills

Toca Tea Party, \$3.99



Toca Store, \$3.99



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## Apps for Leisure & Play Skills

Some other Toca Boca apps:

- Toca Kitchen Monsters
- Toca Hair Salon
- Toca Doctor
- Toca Lab
- Toca House
- Toca Pet Doctor
- Toca Birthday Party
- Toca Builders
- Toca Town
- Toca Tailor
- Toca Train
- Toca Band
- Toca Robot Land
- Toca Nature

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## Apps for Leisure & Play Skills

More Cookies, \$2.79



Other 'More' apps:

- More toast
- More pizza
- More sundaes
- More salad
- More popcorn
- More cakes
- More blender

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### Apps for Leisure & Play Skills

My Playhome, \$2.99



- My PlayHome Stores
- My Playhome School
- My Playhome Hospital

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### Apps for Leisure & Play Skills

Dr. PetPlay, Lite/\$3.99



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### Apps for Leisure & Play Skills

Cars in Sandbox, \$3.99



Quick Color for Kids – Minecraft Edition 1, Free



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### Summary of Findings: Leisure & Play Skills

- Tablets can facilitate:
  - Increased independent engagement in sequence of leisure activities
  - Independent transitioning between activities
  - Increased repertoire of leisure activities
  - Improved ability to use specific leisure items

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### iPads to Teach Daily Living Skills

#### Research Focus:

- Household chores
- Cooking
- Shopping
- Money management
- Pedestrian navigation

#### Instructional Strategies:

- Video modeling
- Video prompting
- Self-monitoring
- Picture and video activity schedule
- Task analysis
- Prompting and prompt fading
- Generalization promotion

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### Teaching Daily Living Skills

- Apps to provide instructional support
  - Visual scheduling apps that allow for embedded video content
  - Pictello
- Specific apps that *may* be useful in teaching specific skills
  - Review apps to ensure skills are taught appropriately for the individual and setting

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## Teaching Daily Living Skills

Money Up!, \$21.99

- CANADIAN bills and coins!!!
- Identifying bills and coins
- How much to pay
- How much money available
- How much money to give cashier
- Calculating if there's enough money for items



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## Teaching Daily Living Skills

MagnusCards, Free

- Create your own digital Card decks to show the steps in a task
- Download Card decks created by others through the app



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## Teaching Daily Living Skills

- Video modeling is a common approach for teaching daily living skills
- Videos can be created and stored in a folder on the iPad or stored online
- Videos stored online can be accessed via QR codes
  - QR codes can be placed in relevant locations (e.g., the washing machine); individuals can scan the code to access the video when needed



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### Summary of Findings: Daily Living Skills

- Most individuals are able to improve independent completion of tasks:
  - Transition independently between daily living tasks
  - Cooking
  - Household chores
  - Hygiene
  - Shopping
  - Pedestrian travel
- Individuals are able to independently use tablet-based supports to engage in daily living tasks

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### iPads to Improve Health

#### Research Focus:

- Monitoring diet
- Weight loss programs
- Medical appointments
  - Imaging
  - Eye exams

#### Instructional Strategies:

- Visual activity schedules
- Video modeling
- Social scripts (stories)
- Device camera
  - Recording food intake
  - Video conferencing with health professionals
- Games

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### Apps for Health Interventions

- Visual scheduling apps
- Pictello
- Timers and calendar
  - Prompt individuals to engage in health-related behaviors at appropriate times

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## iPads to Develop Social/Emotional and Self-Management Skills

### Research Focus:

- Recognizing emotions by reading facial expressions
- Engaging in socially appropriate behaviors
- Self-monitoring and self-evaluating behavior
- Improving collaboration and cooperation
- Increasing engagement during social activities

### Instructional Strategies:

- Video modeling (1:1 and group instruction)
- Social Stories™
- Instructional games
- Teaching individuals to self-record behavior in app
- Teaching individuals to play tablet-based games with peers

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## Teaching Social/Emotional and Self-Monitoring Skills

- Apps to provide instructional support
  - Pictello
  - Visual scheduling apps
    - Use to create self-monitoring checklist
    - Embed video models of pro-social behaviors
  - iReward Chart for self-monitoring checklist
  - Visual timer apps
- Specific apps to address social/emotional and/or self-monitoring skills

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## Apps for Social/Emotional Skills

Let's Face It! Scrapbook, Free

- Developed at the University of Victoria, Centre for Autism Research, Technology and Education



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### Apps for Social/Emotional Skills

You are a Social Detective, \$34.99



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### Apps for Social/Emotional Skills

Conversation Coach, \$39.99

- Designed to support the development of back-and-forth conversation
- Players sit across from one another with the iPad between them; each player takes turns choosing something to say
- 150 premade conversations
- Ability to create conversations



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### Apps for Social/Emotional Skills

FriendMaker, \$1.39

- Based on the book *The Science of Making Friends* by Dr. Elizabeth Laugeson and the PEERS Program
- Addresses a number of social skills
- Includes video demonstrations of social Dos and Don'ts



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## Apps for Social/Emotional Skills

The Social Express, \$5.99/month

- Interactive lessons targeting a variety of social learning skills
- Interactive webisodes
- Progress reports
- Games
- Private social network



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## Apps for Social/Emotional Skills

My DPS, Free

- Works in conjunction with the Social Express
- Child selects how he/she feels
  - Directed to a coping strategy
  - Coping strategy is modeled
- Add images/feelings and select coping strategies



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## Apps for Self-Management Skills

The Zones of Regulation - Exploring Emotions, \$17.99

- Builds on *Zones of Regulation* app
- Multiple environments and scenarios to practice self-management skills

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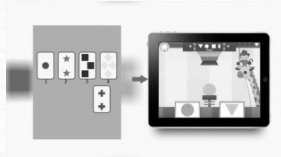
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## Apps for Self-Management Skills

Thinking Time Pro with Kiko, \$6.99

Kiko's Thinking Time, \$69.99 (1 year)

- Designed in collaboration with neuroscientists from Harvard and UC Berkeley
- Activities to address memory, reasoning, flexibility, selective attention, spatial ability and inhibitory control
- Adapts to skill level of player
- Provides data regarding progress



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## Summary of Findings: Social/Emotional and Self-Management Skills

- Improved ability to self-monitor behavior (e.g., increase time on-task)
- Increased eye-contact during conversations
- Increased use of specific pro-social behaviors
  - Joining activities
  - Requesting materials
  - Offering assistance
  - Requesting information
  - Sharing information
  - Commenting

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## Using iPads to Teach Academic Skills

### Research Focus:

- Math skills
- Handwriting/printing skills
- Science concepts
- Academic engagement and task completion
- Comparison of iPad-delivered instruction vs. traditional instruction

### Instructional Strategies:

- Video modeling and video self-modeling
- Prompting and prompt fading
- Use of specific apps to address target skills

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## Teaching Academic Skills with iPads

- Deliver academic content
  - Electronic books
  - Adapted materials
- Document student work
  - Video or audio record
  - Illustrate
  - Write
- Apps to target specific skills

*iPads are the tool, **not** the teacher*

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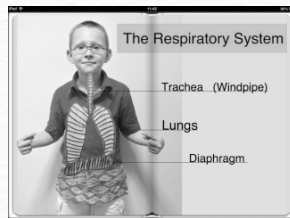
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## Apps for Academic Skills

### Apps to Deliver Academic Content

- Pictello
- Keynote or Powerpoint
- E-books
- Book Creator, \$6.99



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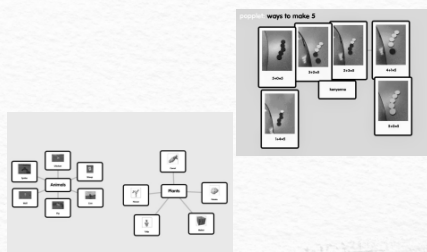
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## Apps for Academic Skills

### Student Work

- Pictello
- Keynote or Powerpoint
- Popplet, \$6.99
- Bitsboard, Free with In App Purchases



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## Apps for Academic Skills

### Apps to Support Participation and Learning

- Visual scheduling apps
- Pictello
- MagnusCards



Miller et al., 2015

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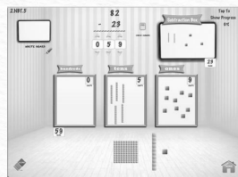
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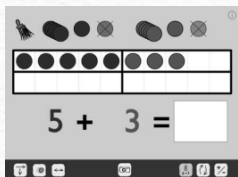
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## Apps for Academic Skills: Math

### Common Core Numbers and Operations in Base Ten, \$1.39



### Twenty Frame for iPad, \$1.39



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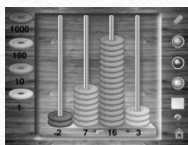
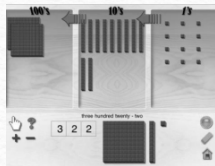
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## Apps for Academic Skills: Math

### Hands-On Math Bundle 1, \$13.99

- Attribute Blocks
- Chip Trading
- Geoboard
- Color Tiles
- Base Ten Blocks



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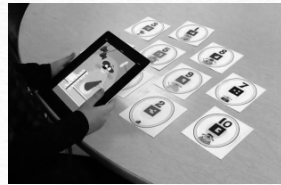
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## Apps for Academic Skills: Math

Fetch! Lunch Rush, Free

- Practice addition and subtraction skills using augmented reality



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## Apps for Academic Skills: Math

Ventura Educational Systems

- Hands-On Math Bundle 2
  - Graph cubes
  - Pattern blocks
  - Parquet blocks
  - Number sense (counting, fractions, etc.)
  - Number balance
- Hands-On Math Bundle 3
  - Hundreds Chart
  - Tangrams
  - More!
- MathPower - Geometry, \$3.49
- MathPower - Algebra, \$2.49
- Elementary Math Games, \$7.99
- Many, many more apps at a variety of skill levels

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## Apps for Academic Skills: Math

TouchMath Pro, \$5.49

- Numbers 0-9
- Number values
- Counting patterns



TouchMath Adventures: Jungle Addition 1, \$13.99

- Counting and sequencing to 20
- Addition to 18
- Greater than/less than
- Addition by counting on



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## Apps for Academic Skills: Math

Adding Apples, Subtracting Sardines, Multiplying Acorns, \$3.99



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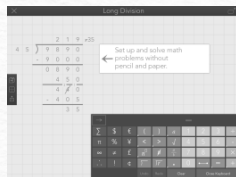
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## Apps for Academic Skills: Math

ModMath, Free

- Virtual graph paper to set up and solve math problems
- Keyboard with expanded set of symbols
  - More advanced symbols can be purchased in app
- Documents can be printed, emailed



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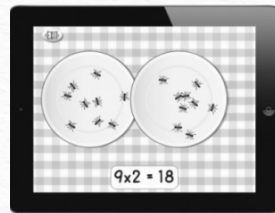
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## Apps for Academic Skills: Math

Show Me Math, Lite/\$54.99

- Animated movies to teach mathematic problem solving
- Portrays math operations visually, with numbers up to 20



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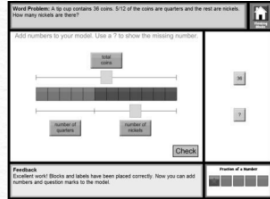
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## Apps for Academic Skills: Math

Other App Developers with Multiple Apps:

- McGraw Hill
  - Everyday Mathematics
- Splash Math
- Math Playground



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## Apps for Academic Skills: Handwriting

Letter School, Lite/\$13.99

- Letters of the alphabet and numbers 1 – 10
- Guided practice
- Independent practice
- Engaging reinforcement



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## Lorah & Parnell, 2014

- Investigated the use of Letter School on an iPod Touch to teach letter writing to 3 preschool aged children with developmental disabilities
  - Used a stylus when working with the app
  - Targeted 3 letters per child
  - Assessed generalization to paper and pencil writing
  - Assessed child preference (iPod Touch vs. paper and pencil instruction)

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### Lorah & Parnell, 2014

- 2 children acquired the skill and generalized to paper and pencil tasks based on app use alone
  - 1 child required adult-delivered prompts and prompt fading to acquire skill
- Rate of acquisition accelerated across letters
  - Children generalized across letters
- Children generalized writing with a stylus on iPod Touch to writing with a pencil on paper
- Two children preferred the iPod Touch; one preferred paper/pencil

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### Using the iPad to Teach Academic Skills

- Determine the instructional goal
- Consider how the iPad may be used
  - Tool to deliver adapted or modified content
  - Tool for students to demonstrate learning
  - Student use of apps to *practice* skill

*Remember*, the iPad is an instructional tool...teachers (classroom teachers, BIs, SEAs, parents, etc.) still need to *teach*

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### Smith et al., 2013

- Use of computer aided instruction, delivered on iPad, to teach science terms to students with ASD in a general education setting
  - Three middle school students with ASD and IQ of 70 or below
  - Grade 7 general education classroom: 25 students, 1 teacher, 1 paraprofessional assigned to another student
  - Study participants sat at tables with 4 peers without disability
  - iPad2 and Keynote used to teach science vocabulary related to classroom content
  - Generalization assessed with paper-based seatwork activities

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Smith et al., 2013

«Your turn: This picture shows

Stimulus for application question

Response options

Your turn: What does this picture show

Yellow star prompting correct response

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Smith et al., 2013

- Participants, teachers, and peers reported the intervention was effective and appropriate
- Peers without disability indicated a strong desire to use iPads at school

Number Correct

Sessions

Participant 1

Participant 2

Participant 3

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### iPads for Literacy Development

Research Focus:

- Engagement and joint attention during shared reading
- Print awareness
- Sight word reading
- Phonologic and phonemic awareness
- Phonics
- Reading comprehension
- Spelling
- Grammar
- Composition

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## iPads for Literacy Development

### Instructional Strategies:

- Time delay
- Modeling
- Prompting and prompt fading
- Graduated guidance

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## Teaching Literacy Skills Using iPads

- iPad as a tool to deliver content
  - Adapted books
- iPad as a tool to support students' demonstration of learning
  - Adapted keyboard
  - Word prediction software
  - Simplified word processors or other authoring tools
- iPad as a tool to teach and/or practice specific skills

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## Apps for Literacy Development

### Duck Duck Moose Books, Free

- Baa Baa Black Sheep
- The Wheels on the Bus
- Itsy Bitsy Spider
- Old MacDonald



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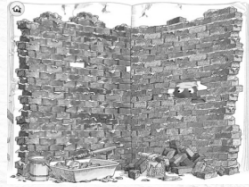
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## Apps for Literacy Development

*The Monster at the End of This Book* (\$6.99) and *Another Monster at the End of this Book*, (\$5.49)

- Readers interact with Grover
  - Cause and effect built into the story
- Text highlighted as read



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## Apps for Literacy Development

LAZ Books, \$6.99/leveled library

- iPad versions of the readingz-z.com books
- No audio or interactive features
  - E-book versions for individual or 1:1 reading practice



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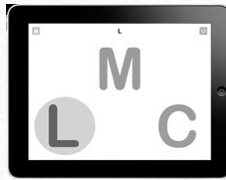
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## Apps for Literacy Development

First Words Deluxe, \$6.99

ABC Alphabet Phonics, Free



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## Apps for Literacy Development

Little Matchups ABC Alphabet, Free

First Words (Ventura Educational Systems), \$1.19



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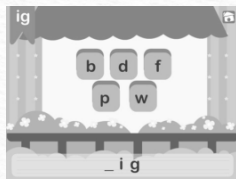
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## Apps for Literacy Development

My Word Wall, \$2.79



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## Apps for Literacy Development

Bitsboard Pro, \$27.99

- Create a variety of games to target specific skills
  - Flash cards
  - Memory
  - Quiz
  - Matching
  - Sentence builder



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## Apps for Literacy Development

Sentence Match, \$5.49



Sentence Key, \$5.49



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## Apps for Literacy Development

Sentence Workout, \$17.99



Sentence Ninja, \$21.99



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## Apps for Literacy Development

Elementary Reading Skills (Ventura Educational Systems), \$13.99 for 4 app bundle

- Each app contains 12 reading passages
- Each passage is followed by three activities to address vocabulary, spelling, recall, and comprehension



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## Apps for Literacy Skills Development

Reading Rehabilitation Toolkit, \$13.99

- Appropriate for older individuals
- Word to image matching
- Image to word matching
- Phrase to image matching
- Image to phrase matching
- Read and answer
- Phrase building




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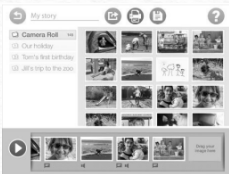
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## Apps for Literacy Skills Development

Our Story for iPad, Free



Superhero Comic Book Maker, Free




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## Apps for Literacy Skills Development

Abilipad, \$27.99



Co:Writer, \$47.99




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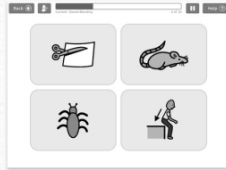
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## Apps for Literacy Skills Development

ALL: Accessible Literacy Learning,  
\$109.99 (Lite/Trial)

- Assessment techniques
- Instructional goals, procedures, materials, data collection:
  - Sound blending
  - Phoneme segmentation
  - Decoding
  - Shared book reading
  - Sight word recognition
  - Reading sentences and simple stories
  - Reading comprehension



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## Summary of Research: Literacy Development

- General outcomes
  - Improvements in targeted skill areas
  - Generalization of skills
- iPad-delivered intervention *does not always* produce better skill acquisition, compared to traditional materials

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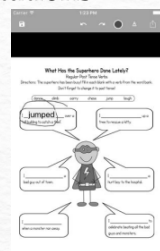
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## Apps for Curricular Adaptations

SnapType, Free (Pro, \$6.99)

- Take photo of worksheet and use keyboard to complete the worksheet
- SnapType Pro allows for:
  - Storage of unlimited worksheets within the app
  - Ability to draw lines on worksheets
  - Ability to change background color



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## Apps for Curricular Adaptations

GoWorksheet Maker, \$54.99

- Take photo of worksheet
- Store and share worksheets
- Allows students to complete worksheets by:
  - Writing on screen
  - Typing in blanks
  - Drag and drop text
  - Record audio
- Auditory and text-to-speech support




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## iPads and Employment

### Research Focus:

- Increasing independent task completion
- Transitioning between tasks and/or remembering what tasks to do
- Reduction of errors

### Instructional Strategies:

- Video prompting
- Video modeling
- Visual schedules
- Use of basic apps (calendar, timer, etc.)

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## Burke et al., 2013

- Use of video modeling, video prompting, and feedback to improve job training and job performance
  - Complex shipping warehouse tasks with a mean of 73 steps (64 – 104 steps)
- Participants were four unemployed men with ASD
  - Aged 19 to 28 years
  - Composite IQ scores ranged from 70 to 121
  - One participant also diagnosed with OCD, ADHD, and Tourette Syndrome
  - Another participant also diagnosed with a visual impairment

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### Burke et al., 2013

- VideoTOTE application on a Samsung Galaxy Tab
- Video models
  - 104 possible task steps required for error-free produce shipping
    - Organizing all materials to be shipped
    - Checking or testing individual items to ensure working order
    - Replacement of faulty equipment
    - Placement of materials in shipping container
    - Printing and attaching shipping label to container
  - Total 13 minutes, 10 seconds of video; edited into 36 segments
- Performance criterion of 100%; required by the employer

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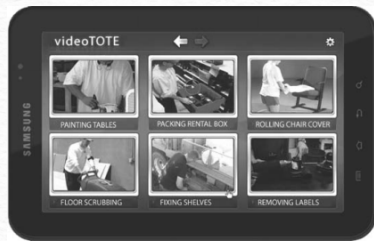
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### Burke et al., 2013



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### Burke et al., 2013



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### Burke et al., 2013

- Prior to baseline each participant experienced a 45 minute, typical on-site training
  - Steps demonstrated by trainer
  - Participants attempted task and received feedback
- Phases
  - Baseline
  - Intervention
    - One week with tablet at home; asked to watch the video as much as possible
    - Told to use VideoTOTE while performing tasks

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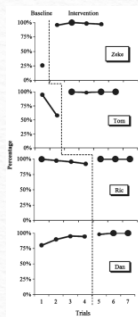
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### Burke et al., 2013

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### Summary of Findings for Employment Research

- Tablet-based supports can increase independence and decrease reliance on job coaches
  - Video modeling and video prompting
- Basic apps (calendar, timer, etc.) and specialized apps can assist employees with disabilities to manage time, transition between tasks, remember assigned tasks, and manage anxiety
- Tablets are viewed as acceptable within the context of employment settings

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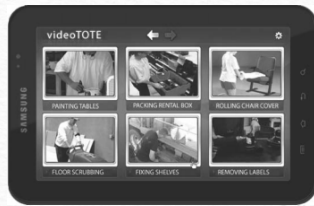
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## VideoTote

• \$3.99



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## VideoTote

- Although developed with teaching employment skills in mind, VideoTote is a great app for any video modeling intervention
  - Daily living skills
  - Social skills
  - Play skills
  - Academic skills
  - Etc.
- There is a very rich body of literature supporting the use of video modeling with individuals with ASD; this is an inexpensive and easy-to-use app to use for video modeling interventions

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## What Do We Know Today?

- Emerging support for the use of tablet devices
  - Across ages and ability levels
  - In a variety of environments
  - Implemented by parents and professionals
- Assessment is critical
  - Making decisions regarding type of device and/or app
  - Ongoing evaluation
  - Individual preference matters

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### What Do We Know Today?

- Behavior analytic instruction is crucial
  - Teach pre-requisite skills (attending and imitation)
  - Teach device operation (on/off, navigation, etc.)
  - Teach device use within context of instruction
  - Teach device maintenance

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### What Do We Need to Consider?

- Time required to create tablet-based supports
  - Video models
  - Visual supports
- Implementer training
  - Device use and maintenance
  - Integration within natural settings
  - Instructional strategies
- Which apps to load
  - SGD app only (dedicated device)
  - Use of guided access to prevent exiting from apps

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### Tablets as a Prosthetic Device

(Lorah et al., 2014)

- Lindsley (1964) suggested that deficient behavior of individuals with developmental disabilities was not an inherent problem, but one of a mismatch between the individual and his/her environment
- Environmental prostheses could narrow the gap between one's skills and the general requirements of the environment

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### Tablets as a Prosthetic Device

- Lindsley (1964) suggested three strategies:
  - Construction of prosthetic devices
  - Prosthetic training
  - Construction of prosthetic environments
- Although presumably not envisioning tablet devices, Lindsley's suggestions are very applicable when considering current technology...

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### Prosthetic Devices

- i-Devices
  - iPad
  - iPod Touch
  - iPhone
  - Apple Watch
- Android Devices
  - Samsung Galaxy
  - HTC One
  - Nexus 10



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### Prosthetic Training

- Individualized, applied behavior analytic instruction
  - Discrete Trial Teaching
  - Errorless instruction
  - Prompting and prompt fading
  - Time delay
  - Shaping
  - Chaining
  - Within stimulus prompting
  - Differential reinforcement
  - Video prompting, video modeling



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## Prosthetic Environments

- Tablets for information in community settings
- Tablet kiosks
- Tablets at restaurants



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## Where Do We Go From Here?

- Ongoing need for research regarding
  - Effective, individualized assessment
    - Device and app selection
    - Progress monitoring
  - Instructional strategies to teach target behaviors
  - Implementer training
  - Effectiveness of tablet use across
    - Lifespan
    - Environments
    - Behaviors or skills
    - Implementers



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