Using Assistive Technology to Enhance Community Living and Work Experiences

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Session Objectives

1. Identify strategies to facilitate use and integration of AT into daily living.

2. Identify assistive technology to facilitate greater independence in community living and employment.

3. Integrate tools and supports for enhancing outcomes in transition and employment
AT Consultation Program
Easter Seals MA

- Launched in 1990
- AT Devices and Services for
  - Independent living
  - School
  - Work
- 17 full-time AT Specialists: OTs, SLPs, COTA, SLPA, Special Educators, Rehab Counselors, IT pro, individual with lived experience, and more!
- Operates several MassMATCH programs: AT Regional Center, AT Loan, AT Long term device loan
What is Assistive Technology?
Defining Assistive Technology: Federal Definition of AT

“any item, piece of equipment, or product systems, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities”
Low Tech/ No Tech

- Easy to use
- Minimal learning time
- No electrical power
- Little or no training needed

Elementary Technology:

- Battery operated devices
- Easy to use
- Minimal amount of learning time

Images www.loc.gov/nls/, samsung.com, allegromedical.com, timetimer.com,
High Technology:

• Complex and programmable
• Often requires training
• May be customizable
• May be costly


Images nuance.com, livescribe.com, enablemart.com, apple.com, amazon.com
“Mainstream Tech” as AT

• Universal design enhances access
• Built in accessibility settings enhance access
• Third party tools enhance access
• Creative modification enhances access
AT User: Luiz

• 21 year old male with an intellectual disability
• lives in an apartment with supports: case manager, personal care attendant hours, coaching
• Experiences difficulty with: time management, spelling, multistep instructions
• In a vocational program, recently started internship at a law office
Framework for Considering AT: The “HAAT Model”

- Human
- Activity
- Assistive Technology
- Context

Luiz and the HAAT Model

Assistive Technology
Best Practices & Solutions
AT Best Practice: Assessment

• Active engagement of clients in the AT assessment process leads to better outcomes
  (Lenker, & Paquet, 2004; Johnston, et al., 2014; Scherer, et al., 2005)

Conclusion: Use assessment & outcome measurements that:
• Support independence
• Are client centered
• Work in multiple contexts
• Valid and reliable
• User friendly
Best Practice: Intervention/Training

• Natural context better than clinic/school for improving independence with AT
  (Burke, et al., 2013; Gentry, 2008; Gentry, et al., 2015; Harvey, et al., 2013; Raghavendra, et al., 2013)

Conclusion: Provide services in the client’s:
• Living environment
• Learning environment
• Working environment
• Community
Best Practice: Devices/Interventions

Synthesized text-to-speech screen reading software can improve reading rate for:

• individuals with learning disabilities (Floyd and Judge, 2012)
• individuals with brain injury (Harvey, et al., 2013)
Best Practice: Devices/Interventions

Mobile devices can improve events & task recall for:

• High school students and adults with Autism Spectrum Disorder
  (Gentry, et al., 2010, Gentry, et al., 2015)

• Adults with chronic neuro conditions
  (Gentry, 2008; LoPresti, et al., 2008; Lindqvist, et al., 2015)
Access to mobile devices

- 77% of American adults own a smartphone (up from 39% in 2012)
  - 42% of adults over 65 own a smartphone
  - 54% of adults who do not have a high school diploma have a smartphone
  - 64% who make <$30K have a smartphone

- Adults who identify as having a disability:
  - 58% have a smartphone (vs. 77%)
  - 61% own a laptop or desktop computer (vs. 81%)
  - 57% have broadband Internet at home (vs. 76%)
  - 36% own a tablet computer (vs. 42%)

Research Study: Using a Mobile Device in the Workplace

• 50 adults with ASD, average age 25 (range 18-60)
• 68% high school diploma, 24% with high school certificate
• Jobs range 8-35 hrs/week: stock clerk, Food prep, Teacher’s aide, Library aide, grocery store, mailroom, an others
• Intervention:
  • Workplace AT assessment with worker, job coach & employer
  • Identified useful apps and functions for iPod Touch
  • Train worker to use iPod Touch functions for job
  • Compare workers using iPod touch to those received job coach alone

(Gentry, et al., 2015)
Results: Using a Mobile Device in the Workplace

• Training with iPod Touch reduced job coaching needs without reducing functional performance on the job
• Work performance btw iPod Touch and job coach similar
• 6 participants had smartphones or PDA, but were not using them to support work tasks
• What does this mean?
  • Individuals with disabilities have a lot to gain by using mobile devices
  • A common mainstream device can be a useful tool

(Gentry, et al., 2015)
Built-in features of mobile devices to enhance function

- Scheduling & Calendars
- To-do lists
- Video modeling for tasks
- Task procedures lists
- Email
- Audio instructions/Recorder
- Speech recognition
- Timers, clocks & alarms

(Gentry, et al., 2015)
Native calendar apps:
• Can be backed up to cloud account (Gmail, iCloud, Yahoo, Outlook, etc)
• Can be maintained/updated/monitored by caregiver or support
• Can have reminder alerts for events: auditory, visual, “nag”, text, email
• Can customize reminder alerts: 1 hour, 10 min, 1 day, multiple alerts
• Can repeat events
• Can view by month, week, work week, day, etc.
• Can learn “what’s my schedule today” by voice
• Can access calendar data with multiple devices (smartphone, computer, tablet, Amazon Echo, etc.)
App: Visual Scheduler Planner
Time Management
AT for Video Modeling and Sequencing

- Mobile devices have built-in cameras for videos and photos
- Create & store instructional videos on their device using Camera app
- Apps to improve access to stored videos, allow for annotation and clarification of steps
  - CanPlan (iOS, 3 tasks free, $14.99 for unlimited tasks)
  - First, Then visual scheduler (iOS & Android, $4.99-9.99)
  - Pictello visual story creator (iOS, $19.99)
App: CanPlan
Video Modeling and Sequencing
App: First, Then Video Modeling and Sequencing
App: Pictello
Video Modeling and Sequencing
Improving Access to Electronic Devices: Low Tech Solutions

Mechanical and orthotic devices can improve access to mainstream or rehab tech

- Mouthstick
- Typing Orthoses
- Capacitive stylus
- Universal Cuff
- Bump-ons

Images: amazon.com, ailmed.com, griffintechnology.com
Improving Access to Electronic Devices: Alternative Mouse

Images: apple.com, kensington.com, targus.com, enablemart.com
Improving Access to Electronic Devices: Alternative Mouse

Images: enablemart.com, tobii.com
Improving Access to Electronic Devices: Alternative Keyboards

Images: enablemart.com, chestercreek.com
Improving Access: Why Speech recognition

Individuals may choose speech to address:

- Typing impairments
- Existing musculoskeletal injury
- Hope to prevent injury
- Difficulty accessing keyboard
- Difficulty accessing mouse
- Slow typing
- Difficulty navigating device

- Dyslexia
- Dysgraphia
- Learning disability
- Tremor
- Weakness
- Coordination impairment
Speech Recognition Exists on Multiple Platforms

- **PC**: Dragon for PC, Windows Speech Recognition, Google Docs Speech Recognition
- **Mac**: Dragon for Mac, Mac OS Dictation, Google Docs Speech Recognition
- **iOS**: Siri, Dragon Anywhere service, Dragon Dictation App
- **Android**: OK Google, TalkType Voice Keyboard, Speechnotes
- **Others**: Xbox One with Kinect, Amazon Echo, Google Home
Case Example: Stephanie

• 28 years old
• medical history of primary generalized dystonia resulting in impaired motor control
• has history of vocal cord polyps, mild dysarthria
• works administration support for a Non-Profit
Video of Stephanie
Steph’s Results

• Typing: 12-16 wpm
• Pre-training dictated ~60 wpm 80% accuracy
• Training: 10 minutes
• Post-training dictated ~54 wpm 95% accuracy (Dragon missed a proper name)
So how are we integrating Assistive Technology into our youth programming at Easter Seals?
Pre-Employment Training

• Work Readiness Training including professional behavior, interviewing and customer service skills taught through a combination of classroom and web based training services
• **All participants receive a Assistive Technology screening**
• All students complete a Community Based paid 12 week Internship to gain valuable on the job experience
• Job Exploration Counseling including: career assessment and planning
• All Students will learn the basics and complete a Resume, Cover Letter and reference list
Transition at Easter Seals MA

• By collaborating with public, private and specialized schools, our Transition Program is able to serve youth through three components:
• Transition Coaching
How are transition students benefitting from their smartphones in the community?

Some things Joe struggles with are:
• Remembering to eat
• Appropriate attire to match outdoor weather
• Time management
• Money management

Some AT being used:
• Swackett
• First Then Visual Schedule By Good Karma Applications
• Visual Schedule Planner By Good Karma Applications
• Organizing his closet according to season

Examples of places in the community:
• Grocery store
• College campus
How will this help Joe?

• If Joe can use this AT successfully, he will learn independence with healthy eating, managing his money to have enough for, not only groceries, but the cost of the Uber to get there (including tricky tipping!).

• If he can use this AT successfully, he will learn to dress appropriately for the season and the workplace, as well as managing his time to get ready in the morning so he’s not late. He can also remind himself to call an Uber with advance notice to get to work.
How are transition students benefitting from their smartphones in the community?

Something things Sarah has difficulty with are:

• Managing real-time money exchange in public places.
• She is unsure of how much money to give a cashier and how much money to expect in return.
• Scheduling and organizing appointments.

Some AT being used:

• Peter Pig’s Money Counting app
• Time Calculator app
• Kahn Academy and ABCya websites
How is this helping Sarah?

• If Sarah can utilize her money apps to increase comfort and speedy in monetary exchanges, she can become more independent in areas of dining out, retail therapy (😊), grocery shopping, etc.

• Using the scheduling apps in relation to areas of public transit allows her to get to work and appointments on time.
Thank you for joining us!

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References

References, cont’d


• Lindqvist, E., Larsson, T. J., & Borell, L. (2015). Experienced usability of assistive technology for cognitive support with respect to user goals. NeuroRehabilitation, 36, 135–149.