

# Using Assistive Technology to Enhance Occupation

Ashley Pinkelman & Jacob Sunder  
Pre-OT Club Presentation

December 9, 2014

Adapted from April 2012 presentation by Marlena Lanini and Brett Turner

# What is Occupational Therapy at CSU?

The mission of the Occupational Therapy department at CSU is to optimize human performance and participation in everyday occupations and contexts across the lifespan.

OT Curriculum Design: <http://ot.chhs.colostate.edu/students/curriculum-design.aspx>



Google image from:  
uscmarketplace.com



Google image from:  
blythedale.org

# Definition of Assistive Technology

- A broad range of devices, services, strategies and practices that aid in assisting individuals with disabilities.
- An AT device is any item, piece of equipment, or product system that is used to increase, maintain or improve functional capabilities of individuals with disabilities.

-Cook & Hussey

# Types of Assistive Technology

- Assistive Technology examples:
  - Technology and electronic information access (ATRC focus)
  - Augmentative Communication Systems
  - Environmental Controls
  - Technology to enhance mobility

# What is the Assistive Technology Resource Center (ATRC)?

- Role on campus: the ATRC seeks to ensure equal access to technology and electronic information for CSU students and employees with disabilities
- Disability groups served – Students with Physical, Sensory, Non-Apparent impairments
- Experiential learning of AT for OT students



# ATRC and Occupation

- Occupational Therapy Role
  - Assessment - Interview
  - Intervention – Equipment recommendation & training
- Goal: increase student participation in school-related activities and enhance academic performance.
  - Reading
  - Writing
  - Note-taking
  - Test-taking
  - Accessing computers and technology

# AT for Physical Impairments

## AT for Typing and Accessing Computer:

- Alternative Pointing Devices (Mice)
  - Head tracker
  - Sip and puff
  - Switches
- Alternative Keyboards
  - One handed keyboards
  - Chorded keyboards
  - On- screen keyboards
- Ergonomic Keyboards and Mice
- Positioning
  - Adjustable tables and monitors
  - Devices, e.g. mobile and static forearm supports



## AT for Writing:

- Alternate Input
  - Voice recognition software
  - Word completion and word prediction software

# AT for Students Who Are Blind

## AT for Reading:

- Braille and Tactile Graphics
  - Refreshable Braille Keyboard
  - Braille Embossers
  - Text to Braille converting software
  - Thermo Pen
  - PIAF (Pictures in a flash)
- Audio
  - Talking Web Browsers
  - Talking Digital Book Players
  - Audio Formatting Software
  - Scanners with OCR to convert text to audio format



## AT for Accessing Computer:

- Screen Readers
- Tactile Key Indicators

## AT for Calculating:

- Talking Scientific Calculator



# AT for Students with Low Vision

## AT for Reading:

- Large Print and Braille
- Digital Book Players
- Built in Accessibility Options
- Software
  - Magnifier and Reading Software
  - Scanning and Reading Software
- Magnifiers
- Portable
- Video



## AT for Typing:

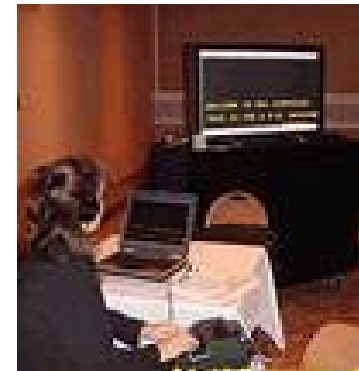
- Labels for keyboard



# AT for Students who are Hard of Hearing

## AT for Note Taking and Classroom Participation:

- FM Systems: Portable, wireless listening system for classroom use. The teacher wears a compact transmitter and microphone. Students use a portable receiver with earphones.
- Captioning
- Communication Access Realtime Translation (CART): instant translation of speech to text via advanced, remote or onsite real-time translation software



# AT for Students with Non-Apparent Disabilities

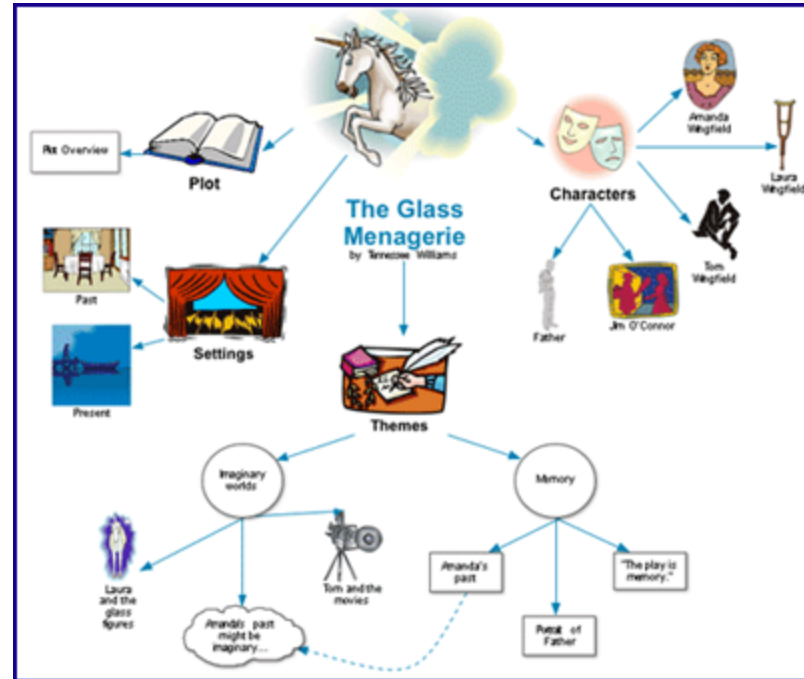
## – Writing Aids

### AT for Writing:

- Spelling and Word Selection
  - Phonetic Spell Checker
  - Word Completion and Word Prediction
  - Talking or Visual Dictionary
  - Word Wizard
  - Homophone Checker
- Thought Organization
  - Thought Mapping
  - Outline Format
- Other Aides
  - Speech recognition: Dictation vs. typing
  - Text to speech

### AT for Note Taking:

- Digital Recorders
- Smart Pen
- Apps for mobile devices



# AT for Students with Non-Apparent Disabilities

## – Reading Aids

### AT for Reading:

#### •Converting Printed Material to Electronic Format

- Scanning with OCR
- Learning Ally (human voice recordings)

#### •Auditory Output

- Portable Book Reading Devices: Digital book players and MP3 players
- E-text Reading Computer Software: Text to speech
- Options: synthesized or human voice, audio only or audio + text
- Apps for mobile devices

#### •Visual Layout

- Size of text and line spacing
- Color of text and background
- Masking
- Highlighting words as they are read
- Speed Reading

#### •Portable Miscellaneous Reading Aides

- Scanning and Reading Pens
- Portable dictionary

The screenshot shows a website for 'The Irlen Method'. On the left is a vertical navigation menu with links: 'What is the Irlen Method?', 'Who We Help', 'Treatments', 'Find an Irlen Testing Center', 'Testimonials', 'Research', 'Training and Workshops', 'Conferences', 'Join International Newsletter', 'View Sample Distortions', and 'View YouTube Videos'. Below the menu is a 'Sample Distortion' section. The main content area has the heading 'The Irlen Method - Helping Children and Adults with processing problems for over 25 years'. Below this is a paragraph of text with several lines highlighted in yellow and blue. To the right of the main text is a sidebar with a Facebook logo and the text 'Find us on Facebook', followed by a 'We Need Your Help!' section with a sign-up form and a 'Click here to read about how you can help >>' link. At the bottom right of the sidebar, it says 'We have 3873 signatures'.

# AT for Students with Non-Apparent Disabilities - Organization

## **AT for Organizing Assignments:**

### •Low Tech

- Checklists, day planners, task sequencing lists, alarms and timers on watches and cell phones

### •High Tech

- Devices: Computers, tablets, smartphones, PDAs
- Software or Apps:
  - Planning: calendars and “to do”
  - Audio notes to self
  - Multimedia prompting system

# AT for Students with Cumulative Trauma Disorders

- Hardware

- Ergonomic keyboards
- Ergonomic mice
- Wrist pads
- Adjustable tables
- Document holders
- Adjustable monitors
- Mobile devices/touch screens



- Software

- Word completion and word prediction software
- Dictation software
- Apps



# Augmentative and Alternative Communication

## AT for Classroom & Social Participation:

- Augmentative and Alternative Communication (AAC) Devices
  - Low-Tech Picture Boards
  - DynaVox, Tango, Toby Lightwriter
  - Software with Communication Boards
  - Apps on mobile devices



# Mobility Technology

- Low-tech: cane, walkers, manual wheelchair, etc.
- High-tech: power wheelchairs

- Direct Control: use body part or extension to directly interact
  - Fastest control method
  - More intuitive
  - Requires refined, control movements



- Indirect Control: requires an interface between user and the wheelchair; switches and scanning
  - Slow control method
  - Requires less motor control, but higher cognitive demand than direct control





# Environmental Control Units (ECU)

- Control interface that enables people to control various devices in their environment independently
  - Lights
  - Electrical Appliances
  - Heating/Cooling Systems
  - Stereo
  - TV
  - Computer

# Mobile Devices

- Apps for iOS & Android to support:
- Life Organization
  - Scheduling /Time Management
  - School Organization
  - Note taking/Audio Recorders
  - Financial Organization
  - Work Organization
  - AAC
  - Reading
  - Community Mobility and Accessibility
  - And on and on.....



# Hands-On Opportunities!

- Case Studies
  - Alternative Keyboards and Mice
  - Reading Aides
  - Augmentative and Alternative Communication
  - Alternative Computer Access
  - Environmental Control Unit Use
  - Cognitive Support
  - Low Vision Support
- Microsoft Office Built-Ins
- Mac Accessibility Features

# Hands On Time

Explore case studies at the ATRC!

Questions?

[ATRC Website](#)

[www.atrc.colostate.edu](http://www.atrc.colostate.edu)