Digital Supports for Written Productivity and Literacy

**Today we will cover:**
- Assistive Technology SETT Framework Tools and Resources
- Written Productivity Profile: Gathering information to determine supports for handwriting and keyboarding
- Accessibility Options
- Written Productivity Supports
- Literacy Supports
- iDevice accessibility options, apps, and resources

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**The SETT Framework**

**Student, Environment, Task, Tools**

Joy Smiley Zabala, Ed. D., ATP

The SETT Framework: Student, Environment, Tasks, & Tools

- The Student / Self
  - The person who is the central focus of the process and for whom everyone involved in any substantial life activity is an advocate

- The Environments
  - The customary environments in which the person is expected to live, learn and grow

- The Tasks
  - The specific things that the person needs to be able to do or learn to do to reach high levels of participation and achievement

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**Determining WHAT you need is always driven by WHY you need it!!**
Describe Current Conditions to Establish Educational Need

STUDENT

- Jeff - 13 yrs old - 7th grader
- Medical Diagnosis - Hypotonia
- Educational Diagnosis - OI
- Hypotonia mainly impacts handwriting
- Fatigues when hand-writing
- Mainly impacts handwriting
- Fatigues when hand-writing
- 3 hours of homework at night with study buddies
- IEP goals related to increasing rate of written productivity while not lowering quality or independence
- Avid video game player
- Requires no curricular modifications

ENVIRONMENTS

- In accelerated classes
- Two story building
- Classes in subject area wings
- Computers in some classrooms
- Receives OT’s hour per week
- OT in separate classroom (OT reports that Jeff concentrates better and does not disrupt others in this room)
- OT primarily strengthens exercises on manual typewriter for endurance
- Currently has accommodation of multiple lockers so books kept near classrooms
- Additional set of books home
- Study buddies do homework and play video games each evening
- Parents expect college and law school
- Well-liked by teachers and peers

TASKS

- IEP goals related to increasing rate of written productivity while not lowering quality or independence
- Weekly note-taking
- Increasing length of written assignments

WATI Guides:
Wisconsin Assistive Technology Initiative www.wati.org
- GUIDES designed to gather information for all areas of Assistive Technology
- WATI free resources include: AT Laws for Schools, AT Consideration, AT Assessment Guides, Observation Guides, Referral Forms, AT Checklists, Transition Guides, as well as support resources for AT Multiple Challenges and AT for Autism Spectrum Disorder
- Forms available in Spanish as well!

Student Information Guides

- Section 1 - Seating, Positioning and Mobility*
- Section 2 - Communication*
- Section 3 - Computer Access*
- Section 4 - Motor Aspects of Writing
- Section 5 - Composition of Written Material
- Section 6 - Reading*
- Section 7 - Mathematics*
- Section 8 - Organization**
- Section 9 - Recreation and Leisure
- Section 10 - Vision
- Section 11 - Hearing
- Section 12 - General

*changed 2009  
**new 2009
**AT Continuum**

**Low Tech**
- Non-electronic devices such as magnifiers, pencil grips, raised line paper, communication booklets, etc.

**Medium Tech**
- Non complicated mechanical devices such as portable word processors, switch-operated activities & appliances, calculators, audio books, etc.

**High Tech**
- Devices that incorporate sophisticated electronics or computers such as speech recognition programs and electronic communication devices

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**Low-Tech Supports**

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**Low-Tech Writing Tools**

- RediSpace Notebook Paper
- Bright Lines Paper
- Raised Ruling Tablet

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**Free Paper Resources**

- Do2learn free handwriting paper
- Super sentences

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**LoTTIE Kits: Low Tech Tools for Inclusive Education**

- Collection of low and mid tech tools
- The kit provides a full range of low tech tools in a convenient case for storage and transport.
- Designed to help students in: reading, writing, math, and organizational skills, the LoTTIE Kit allows teachers to informally evaluate and try out simple devices before automatically requiring more sophisticated and expensive technologies.

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Handwriting and Keyboarding

Is faster better?
- The goal of writing support: Increase the “productivity” of the writer
- Productivity in AT has been defined as:
  
  Quantity + Quality
  Time

Productivity increases
- When in the same time or more time,
  - Legibility, spelling accuracy, capitalization, punctuation increases
  - The variety of words increases
  - The number of words or sentences written increases
  - The number or quality of ideas, details, text elements improves

Handwriting vs.. Keyboarding
- Often, the question is asked:
  - “When does a student who has poor handwriting switch to keyboarding?”
  - Answer – DO BOTH!!
- Parallel Intervention = Work on both handwriting & keyboarding
- Best practice is to have multiple modalities for expression

The most important question is to find out WHERE the breakdown is occurring.
What part of writing is difficult or hard for the student to complete? (comparable to their peers)

Information to Gather...
- Can the student generate his/her own thoughts?
- Can the student organize those thoughts?
- Can the student spell enough to use spell check?
- Is the student familiar with the keyboard?
- Is the student already using the computer to assist with writing assignments?
Research also shows that:

- Mechanical issues such as spelling, working memory, letter formation and spacing can be difficulty for students with learning disabilities.
- Graham (1990) states that when mechanical demands are eliminated, LD students produce more since there is less interruption to the composing process.

More Research...

- Pisha (1993) did a study of 88 students (typical and special ed.) ages 8-13 in grades 3-6.
- Results indicated older students made progress faster in keyboarding skills
- **Handwriting ability was NOT a factor in learning the keyboard.**
- Students receiving special ed. were able to acquire keyboarding skills at the same rate as students not receiving the services.
- Recommends keyboarding is introduced in grades 5 or 6, once students have had sufficient time to develop manuscript writing.

Handwriting

- Poor handwriting needs to be investigated.
- **If spelling is the only barrier, then the use of a portable word processor will be ineffective by itself.**
- Handwriting is not a motor issue if it is legible to the reader and keeps reasonable pace given the age, grade, or developmental age of the student.
- Data and trial periods using no-tech and low tech need to be collected.
- High tech options often do not represent the Least Restrictive solution.

(DeCoste, 2005)

Written Productivity Profile
Denise DeCoste, Ed.D., OTR

Forms – Find on SCCATN WIKI OR HIAT Website
www.sccatn.wikispaces.com
http://www.montgomeryschoolsmd.org/departments/hiat/resources/wpp.shtm

- Directions for Completing WPP
- Form for Summarizing Information
- Handwriting Speeds
- Spelling Analysis

Available from Don Johnston, Inc
http://www.donjohnston.com

Look At The Results

- Carefully compare the handwriting sample with the typing sample.
- Its not just about speed (wpm)
- What are the similarities?
- What are the differences?
- Is the writing legible? Is the typing legible?
- Examples

Portable Word Processors

Some features available:
- Keyboarding tutors
- Text-to-speech
- Wireless transfer
- Palm applications
- Math supports
- Word prediction
- AR & other tests
- Google Docs transfer

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Word Prediction

- A list of word choices appear by typing one or two letters.
- Reduce the number of keystrokes made by "predicting" the desired word after a student types a single letter.
- Some include a "predict ahead" feature that anticipates the next word.
- Improves the quality and level of writing by suggesting new words stored in a customizable dictionary.
- Can add vocabulary pertinent to different topics or courses.

Word Prediction

- Does not increase speed for students with keyboarding speeds greater than 5 wpm
- For students who type fewer than ~ 5 wpm, word prediction has the possibility to increase speed up to ~ 5 wpm
- Not recommended to start use of word prediction for students who have not had sufficient time to develop keyboarding skills, and that are expected to develop average keyboarding skills

Examples of Word Prediction

CoWriter
www.donjohnston.com
Word prediction before & after examples

Word Q
www.wordq.com

Let-Me-Type

- Free Word Completion Program can use in any program
- Keeps track of words typed, and adds to the vocabulary list.
- Can import text from other word lists (i.e. click n type) or create your own!
- Follow cursor or maintain fixed location
- Change colors, font, number of words listed, number of letters typed required to bring up word window

Let-Me-Type

Speech Recognition

To support quality of writing
- Removes the motor demands of writing
- Written Productivity Profile = difficulty with both writing & keyboarding
- More restrictive
- Requires quiet environment, consistency is more important than articulation
- Typically not used for note taking, but for homework and independent written work
- Try Microsoft Speech Recognition First
Speech Recognition

To support access
- For students who are not able to physically access the keyboard and mouse
- Requires quiet environment, consistency is more important than articulation
- Most likely require a program that provides full control of the computer (i.e. Dragon Naturally Speaking)

Examples of Speech Recognition

- Dragon Naturally Speaking
  - http://www.nuance.com/
  - Full hands-free control of the computer
- Speak Q
  - www.wordq.com
  - Need to have WordQ
  - Speech-to-text, not hands-free access
  - Use with WordQ for speech recognition & word prediction

Speech Recognition

- MS Office 2003 + Windows XP = Yes
- MS Office 2007 + Windows XP = NO
- Vista and/or Windows 7 = YES

Speech Recognition: Vista and Windows 7

Built into the Operating System
- Open Speech Recognition by clicking the Start button, clicking Control Panel, clicking Ease of Access, and then clicking Speech Recognition.
- Click Set up microphone, follow the instructions in the wizard.
- Dictate into almost any application (i.e. word processing, internet)

Common Speech recognition Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start voice recognition</td>
<td>Speak Q to start speech recognition.</td>
</tr>
<tr>
<td>End voice recognition</td>
<td>Speak Q to end speech recognition.</td>
</tr>
<tr>
<td>End paragraph or line not documented</td>
<td>Press Enter or Backspace.</td>
</tr>
<tr>
<td>Save outline as document</td>
<td>Click Save.</td>
</tr>
<tr>
<td>Select entire document</td>
<td>Click Selection.</td>
</tr>
<tr>
<td>Select and control a box on the screen</td>
<td>Click and drag.</td>
</tr>
<tr>
<td>Open window to display window contents</td>
<td>Click on window.</td>
</tr>
<tr>
<td>Update the list of spoken commands that are currently available</td>
<td>Click on command.</td>
</tr>
<tr>
<td>Make the sample file for you</td>
<td>Click on file.</td>
</tr>
<tr>
<td>Make the sample file</td>
<td>Click on sample file.</td>
</tr>
<tr>
<td>Remove the Speech Recognition microphone out of the way</td>
<td>Click on microphone.</td>
</tr>
<tr>
<td>Increase speech recognition sensitivity</td>
<td>Click on sensitivity.</td>
</tr>
<tr>
<td>Decrease speech recognition sensitivity</td>
<td>Click on sensitivity.</td>
</tr>
</tbody>
</table>

Organizational Software

- Difficulty organizing thoughts & ideas
- Difficulty with initiating composing written work, too overwhelming or not sure where to start
- Can be used with additional support software (i.e. text-to-speech, speech recognition)
Examples of Organizational Software

Draftbuilder
www.donjohnston.com

Inspiration & Kidspiration
www.inspiration.com

Pictures/Symbol Writing Support

• Student does not have phonemic awareness
• Not able to select a word from a word list (i.e. know to type ‘T’ for tree).
• Is able to identify pictures/symbols, or photos
• Most all have audio output
• Can use picture supported software for the student to:
  – To click/select multiple symbols to create a sentence
  – To insert a picture once a word is typed

Examples of Picture Writing Software

Symwriter

Clicker 5
www.cricksoft.com

Pixwriter
http://www.slatersoftware.com/pixwriter.html

Windows XP Accessibility Features

Mouse
• Cursor – enlarge, change colors, & speed
• Control the width and blink rate
• Display pointer tails
• Mouse Keys – controlling the mouse using the keypad

Keyboard
• StickyKeys – pressing one key at a time for key combinations
• FilterKeys – ignore brief & repeated keystrokes
• ToggleKeys – Hear tones when pressing certain keys
Windows XP Accessibility Features

www.microsoft.com/enable

**Vision**
- Screen Resolution & Contrast
- Font & Icon Size
- Cursor Width & Blink Rate
- Magnifier

**Sound**
- Sound Volume
- Sound Schemes
- Show Sounds
- Text-to-Speech

MS Accessibility
Onscreen Keyboard

- Students who:
  - Can’t access a “regular” keyboard
  - May benefit from an onscreen keyboard
- Start → All Programs → Accessories → Accessibility → On-screen Keyboard

Click-N-Type

- Free on-screen keyboard with word prediction
- Keyboard size can be adjusted, no limit
- QWERTY, ABC, & Joystick layout
- Change Keyboard colors
- Modify & Add to word list
- Dwell & Scan Access for Mouse Click
- Windows 95 - Vista

Adaptive & Alternative Input Devices

**Adaptive Keyboards**
- Large Keys Keyboard
- ABC Keyboard Layout
- Keyboards for one-handed typist
- ZoomCaps for Vision Needs
- Universal Keyboards

**Adapted Mice**
- Mini Mouse
- Trackball – limit motor movement
- Joystick
- Touch Pad
- Single Switch
- Touch screen

Low Tech pointing devices

Typing pointers
Head pointers

Adaptations for keyboards

**Keypads**

Stickers for keyboard
Adapted keyboards and mice

Trackball  Joystick  Touchpad

Adapted keyboards and mice

Head Mouse  Touch Screen  Switch access

Adapted keyboards and mice

Expanded and Programmable keyboards

Intellikeys Keyboard  BigKeys and SAM Trackball

Camera Mouse

http://www.cameramouse.com/

Eye Gaze Computer Access

The Basics of Eye Tracking

• An eye tracker estimates the point of gaze with extreme accuracy using image sensor technology that finds the user’s eyes and calculates the point of gaze with mathematical algorithms. In other words, the eye tracker works much like you would if you face another person and estimate at what they are looking just by observing their eyes.

Eye Gaze Computer Access

Pupil center corneal reflection

• Most modern eye trackers are based on the fundamental principle of corneal-reflection tracking.
• One or several near-infrared illuminators, invisible to the human eye, create reflection patterns on the cornea of the eyes.
• Image processing is used to find the eyes, detect the exact position of the pupil and/or iris, and identify the correct reflections from the illuminators and their exact positions.
Literacy Supports

What is Text-To-Speech?
- Combination of text appearing on the computer display together with the computer speaking that text aloud with a digitized or synthesized voice. Digitized speech is a recorded (or digitized) human voice speaking, and synthesized voice is a computer-generated voice speaking the text.

Natural Reader
- http://www.naturalreaders.com/download.htm

Vu-Bar
- http://www.fxc.btinternet.co.uk/assistive.htm

Screen Highlighter – SS Overlay
- http://www.fxc.btinternet.co.uk/assistive.htm

Protocol for Accommodations in Reading
- Free from Don Johnston!
- The PAR manual helps you determine the most suitable reading accommodations for specific students by assessing their individual needs. Anyone on the IEP team can administer PAR to systematize how reading accommodations are recommended on a student level or across the school district.
iDevices!

Accessibility Features
Vision
- VoiceOver
- Zoom
- Large Text
- Invert Colors
- Speak Selection
- Speak Auto Text
Hearing
- VoiceOver
- Zoom
- Large Text
- Invert Colors
- Speak Selection
- Speak Auto Text

http://www.apple.com/accessibility/

Accessibility Options

Built-in accessibility
- VoiceOver
- Zoom
- Large Text
- Invert Colors
- Speak Selection
- Speak Auto Text

3rd party accessories
- Mounts
- Switches
- Keyboards
Accessibility Options

- Physical & Motor
  - Assistive Touch
  - Home Click Speed

Accessibility Options: NEW!

Guided Access! New in iOS6

- Video on how to turn on Guided Access
  - https://docs.google.com/open?id=0B5KeW-3vW1K052WIRQG2qA
- Guided Access blog post directions

Accessibility Options: NEW!

Speak Selection (Text-to-Speech)

- Video on how to use Speak Selection
  - https://docs.google.com/open?id=0B5KeW-3vY1X033VSa19x5C1ZQjQ
Accessibility Options

- Built-in accessibility
  - VoiceOver
  - Zoom
  - Closed Captioning

- 3rd party accessories
  - Mounts
  - Switches
  - Keypads

3rd party accessories

- Mounts
- Switches
- Keypads

iPad apps for special needs

- Math
- Communication
- Organization
- Literacy
- Social skills

App Evaluation Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Authenticity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Evaluation</td>
<td></td>
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</tr>
</tbody>
</table>

Ways to find and evaluate apps

- iTunes App Store
- Facebook and Twitter
- YouTube videos
- Websites and blogs
- Word of mouth
- SETT Framework
- Feature matching
- App evaluation rubric
Read2Go
- Features
  - Access to Bookshare
  - TTS with text and sentence highlighting
  - Configurable audio
  - Configurable font size
  - Configurable colors

Video on how to use Read2Go
https://docs.google.com/a/ttsd.k12.or.us/file/d/0B5KeW3y1XcFBfcXpPSUpZMlk/edit

FOTA Conference 2012
Video on how to use Read2Go

Abilipad
- Features
  - Expandable keyboards
  - Word prediction
  - TTS
  - Configurable colors
  - Export to email, print, or clipboard

AudioNote
- Features
  - Sync a note and audio recording
  - Type or write notes
  - Seek audio via text
  - Highlighted notes during playback
  - Import and export AudioNote files

TimeTimer
- Features
  - Create and play multiple timers
  - Repeats
  - Configurable colors
  - Configurable sounds
  - Play even when you're outside the app

Typ-O
- Features
  - Word prediction
  - Spell check
  - TTS
  - Configurable voices
  - Configurable text

Dragon Dictation
- Features
  - Voice-to-text
  - Sent as text, email or pasted using clipboard
  - Twitter/Facebook
  - Editing via suggested words
  - Voice driven corrections
iDevice Accessories

- iDevice cases range from inexpensive silicon overlays to the impact resistant Otterbox Case
- Bluetooth keyboard can be added to support text entry into an iPad or other iDevice
- Using conductive foam pointing devices can be made or a pre-made stylus can be purchased

Device Accessories

- AMDI iAdapter (protective case, dual amplified speakers, protected cover for home button, rechargeable battery 10 hr run time $198)
  - [http://www.amdi.net/store/iadapter.html](http://www.amdi.net/store/iadapter.html)
- Modular House – Mounting Kit ($75)

App Resources:

- SCCATN App Page – Over 20 resources!
  - [http://sccatn.wikispaces.com/Apps+for+iDevices](http://sccatn.wikispaces.com/Apps+for+iDevices)
- Pintrest Page: Lauren S. Enders, MA, CCC-SLP
- AOTA Apps for your practice area
  - [http://www.aota.org/Practitioners/Resources/Apps.aspx](http://www.aota.org/Practitioners/Resources/Apps.aspx)
Florida Alliance for Assistive Services and Technology (FAAST)
• The Florida Alliance for Assistive Services and Technology (FAAST) is a non-profit organization that provides Floridians with disabilities of all ages with access to assistive technology.

http://www.faast.org/
Voice Toll-Free 1-888-788-9216

AT Resources
• ABLEDATA http://www.abledata.com ABLEDATA is sponsored by the National Institute on Disability and Rehabilitation Research, U.S. Department of Education. The searchable ABLEDATA database contains over 21,000 products.
• Alliance for Technology Access (ATA) http://www.ataccess.org The ATA provides AT information and support services to children and adults with disabilities.
• ATSTAR Program http://www.atstar.org The Assistive Technology - Strategies, Tools, Accommodations and Resources (ATSTAR) Program is designed to increase AT expertise through technology-enhanced learning environments.
• Assistive Technology Industry Association (ATIA) http://www.atia.org The Assistive Technology Industry Association is an organization of manufacturers, sellers or providers of technology-based assistive devices and/or services. The organization sponsors the ATIA annual conference and the Assistive Technology Outcomes Journal.
• Assistive Technology Training Online (ATTO) http://www.at-training.com The Assistive Technology Training Online Project provides internet-based training in both general and specific areas of adapted computer use.

FAAST HQ Statewide AT Device Loan Program
www.faast.org/programs/device-loans
• To find items in the FAAST Assistive Technology (AT) Device Loan Program database, users can search for items by keyword or browse the available items by category. Items may then be added to an online AT loan request. FAAST requires AT device loan agreements.
• Devices are shipped to the borrower and returned to FAAST at no cost to the user.
• Items are loaned for a term of 30 days.

AT Resources
• Georgia Project on Assistive Technology (GPAT) http://www.gpat.org GPAT is a project of the Georgia Department of Education: Division for Exceptional Students, providing a range of technical support services in the area of assistive technology to local school system personnel and their students. Contains helpful resources, forms, and a video-linked consideration guide. GPAT Videos http://cofe.csun.edu/gpat/Video_Tips.htm
• Guide to the Individualized Education Program http://www.ed.gov/parents/needs/speced/iepguide/index.html This publication is provided by the U.S. Dept. of Education and contains useful information related to developing effective IEPs.
• LD Online http://www.ldonline.com This interactive website provides resources on learning disabilities to parents, teachers, children and other professionals. The site includes books, articles, videos and a newsletter.
• LD Resources http://www.ldsresources.com This site provides resources for people with learning disabilities. Materials include essays, articles, resources and other materials that can be used for non-commercial purposes only.
• National Assistive Technology Research Institute (NATRI) http://natri.uky.edu (NATRI) conducts assistive technology (AT) research, translates theory and research into AT practice, and provides resources for improving the delivery of AT services.

AT Resources
• California State University at Northridge, Center on Disabilities (CSUN) http://www.csun.edu/cod/ Located at California State University, Northridge, the Center on Disabilities develops and publishes materials of interest to the field of disability and sponsors conferences, seminars, and workshops.
• Center for Applied Special Technology (CAST) http://www.cast.org CAST is an organization that works to expand learning opportunities for all individuals, especially those with disabilities, through the research and development of innovative, technology-based educational resources and strategies.
• Closing the Gap http://www.closingthegap.org This web site spotlights resources in computer technology, special education and rehabilitation. The Resource Directory is a database of over 2000 hardware and software products which is web searchable. Links to vendors are included.
• Council for Exceptional Children (CEC) http://wwwcec.sped.org CEC is an international professional organization dedicated to improving educational outcomes for individuals with exceptionalities, students with disabilities, and/or the gifted. Services provided include professional
AT Resources

• Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) http://www.resna.org/resna is an interdisciplinary association that provides a credentialing program for assistive technology service providers. The RESNA Technical Assistance Project provides technical assistance to the 56 state/territory programs as authorized under the AT Act of 1998.

• Technology and Media (TAM) Division of CEC http://www.tamcec.org TAM is a division of the Council for Exceptional Children (CEC) that works to promote the effective use of technology and media for individuals with exceptional educational needs. The site includes information on conferences and professional publications including the JSET Journal.

• Texas Assistive Technology Network (TATN) http://www.texasat.net TATN is a collaborative network between the twenty (20) education service centers in Texas with Region 4 Education Service Center in Houston providing statewide leadership. The site provides links, resources, and training materials.

• Wisconsin Assistive Technology Initiative (WATI) http://www.wati.org WATI is a statewide project funded by the Wisconsin Department of Public Instruction to help all school districts develop or improve their assistive technology services. It includes information on best practices, training materials, resources, sample forms, and provides links to other sites related to AT.