Current technology solutions for students who are blind/visually impaired

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Types of Assistive Technology for Students who are Blind or Visually Impaired

- **Mainstream Tools** for use by the general population as well as the blind and visually impaired population
  - Examples:
    - Felt-tip pens (20/20 markers)
    - Built-in computer magnification
    - iPads

- **Specialized Tools** available specifically for blind and visually impaired user.
  - Examples
    - Magnifiers (hand-held, desktop)
      - Near and Distance
    - Braille devices
    - Auditory devices
Modalities for Accessing Print

- Examples of technology for accessing print
  - **Visual Access**
    - Large print books
    - Magnifiers
  - **Tactile Access**
    - Braille
    - Tactual graphics
  - **Auditory Access**
    - Computer Screen Readers
    - Talking Books

Accessing Print Visually

- Enlarged print on a Photocopier
  - Percentage enlarged
  - Distance from face
- Pros and Cons
  - *Willingness of student to use enlarged materials*
  - *Photocopy might not be as clear as original*
  - *Large print takes up more space in folders, on desk etc.*
Accessing Print Visually

- Large Print Books
  - Cons
    - Heavy
    - Require a lot of space

- Nonoptical Devices (mainstream)
  - Felt-tip pens (20/20 markers)
  - Lighting
  - Reading stands

Accessing Print Visually

- Optical Devices
  - Handheld magnifiers and stand magnifiers
    - Cost:
      - Magnifiers range from $20.00 to $140.00
    - Pros
      - Lightweight
      - Easy to use
      - Small in size
    - Cons
      - Loss
      - Damage

Coil Fixed Stand Magnifier
Dome Magnifier
Accessing Print Visually

- **Video Magnifiers (CCTV’S)**
  - **Desktop Video Magnifiers**
    - **Price Range - $2,200 - $4,000**
  
  - **Examples:**
    - Acrobat Electronic Magnifier
    - SmartView Graduate
    - ClearView with Color Monitor

Accessing Print Visually continued

- **Video Magnifiers (CCTV’S)**
  - **Pros**
    - Stationary
    - Less likely to break
    - May allow for both distance viewing, close viewing, and self viewing
    - Auto-focus
    - Some models are portable, compact, and lightweight.
    - Some models are Flexible.
    - Some Models can magnify from 2x to 50x.
    - Some models come with a screen, some use the computer screen.
    - Some models can be controlled with a single button
Accessing Print Visually continued

- Video Magnifiers (CCTV’S)
  - **Cons**
    - Require a lot of space
    - Student may have a negative attitude about using device
    - Expensive
    - Most require power source
  - **Points to consider**
    - Is there enough space for the unit?
    - Is there a power source?
    - Is it the most practical solution for student?
    - How will it meet the student’s needs now and in the future?

Accessing Print Visually

- **Portable Video Magnifiers**
  - **Price Range** - $500.00 - $2000.00
  - **Examples**
    - Ruby
    - Amigo
    - Pebble
  - **Pros**
    - Light weight
    - Portable
    - Some allow for distance as well as close viewing
    - Freeze Frame Features
    - Glare reduction feature
Accessing Print Visually

• Portable Video Magnifiers continued
  • Pros
    • 2x to 14x magnification
    • Writing stand included with some models
    • Some models can connect to a TV or computer screen for increased magnification.
  • Cons
    • More prone to damage
    • Loss
    • Screen size
    • Ability to write underneath magnifiers
    • Student may have a negative attitude about using device.
  • Points to consider
    • Can the student use the device in various environments?
    • Is it the best solution for the student?
    • Who will be responsible for loss or damage?

Accessing Print Visually

• Scanning Systems for Accessing Print Information Visually
  • Price Range - $800-$1,500.00
  • Examples
    • The PEARL Portable Reading Solution with Open Book Software
    • Kurzweil 1000 with scanner
    • WYNN Wizard and WYNN Reader with Scanner
Scanning Systems for Accessing Print Information Visually (continued)

- **Pros**
  - Instant access to class material
  - Ease of use
  - Adjustable fonts, contrast and background and foreground colors
  - Speech Synthesis
  - OCR Scanning
  - Some products have natural sounding voices
  - Quick access to a wealth of information
  - Accessible to Braille note-takers, Braille embossers and refreshable Braille displays.

- **Cons**
  - Space consideration
  - Access to power supply
  - Training required
  - Expensive
  - May not work with graphics, colored paper, fancy fonts.
  - Portability

- **Points to Consider**
  - Can the student be trained to use the system?
  - Who will be in charge of setting up the system if it is portable?
  - Will other staff be trained on the system use?
  - Is it the best choice for the students needs?
Accessing Print Visually

- Computer with Screen Magnifier
- Screen Magnification available on both PC and Macintosh platforms.
  - Built-in screen magnifiers
  - Screen magnification software
    - Examples
      o Zoomtext
      o Magic
- Price Range - $245.00 - $500.00

Accessing Print Visually

- Computer with Screen Magnifier
- Pros
  - Some software has speech output option and magnification features.
  - Customizable to increase clarity
  - Some software comes with large-print keyboard
  - Dual monitor mode
  - Up to 36x magnification
  - High contrast mode available
  - Partial screen magnification mode
  - Tracking enhancements
Accessing Print Visually

- **Computer with Screen Magnifier**
  - **Cons**
    - Tracking challenges
    - Image may not remain as clear as magnification increases.
    - Training
    - Attitude of student
    - Magnification is variable on the internet.
  - **Points to Consider**
    - Does the student have enough usable vision to benefit from software?
    - Will the student be trained?
    - Will the student independently access software?
    - Is this the proper tool for the student?

Accessing Print Tactually

- **Low Tech Tools**
  - **Slate and Stylus**
  - **Pros**
    - Lightweight
    - Portable
    - Inexpensive
  - **Cons**
    - Slow
    - May be confusing for the student to learn (Braille in reverse
Accessing Print Tactually

• **Low Tech Tools**
  • Perkins Braille Writer
    Cost: $700.00
  • **Pros**
    • Ease of use
    • A good learning device
    • Does not require a power source
    • One-to-one correspondence from the Braille keyboard to the Braille cell produced on the paper.
  • **Cons**
    • Heavy
    • Takes strength to press the keys

Accessing Print Tactually

• **High Tech Tools**
  • **Braille Note takers**
    • Price range - $2,500 - $7,000
  • **Examples**
    • Braille Note Apex
    • Mountbatten
    • Pac Mate
    • Braille Sense
## Accessing Print Tactually

- **Braille Note takers continued**
- **Pros**
  - Dual sensory feedback, both tactual and auditory, (if it has the Braille display option).
  - Not as much strength required to press keys.
  - **More uses including:**
    - Scientific Calculator
    - Word Processor
    - Book Reader
    - Email
    - Media Player
    - Many Braille note takers have blue tooth accessibility
    - Most note takers run on Microsoft Windows CE Operating System.
- **Cons**
  - Expensive
  - Specialized technology – Limited to people familiar with Braille
  - Limited computer capabilities
  - Connectivity Issues (serial, parallel or USB ports)
  - Some students use a Braille Note Taker in place of a computer and do not learn how to use a computer.
  - Can be more expensive than a computer setup using a screen reader and a refreshable Braille display.
Accessing Print Tactually

- Braille Note takers (continued)
  - Points to Consider
    - Braille Note Takers are specialized devices specifically for the blind.
    - Is this the best solution for the student now and in the future?
    - Are there other options?

Accessing Print Tactually

- Refreshable Braille Displays
  - Examples
    - Focus 40 or 80
    - Braille Connect
    - Braille Pen
  - Price Range - $150.00 - $8,000.00
  - NOTE: Typical price for a 40 cell Braille display is around $3,500.00
  - Pros
    - Bluetooth accessibility on many units
    - Allows blind user to read, in Braille, what appears on the computer screen or IOS devices.
    - Refreshes as the reader moves through the content of the screen.
Accessing Print Tactually

• Refreshable Braille Displays (continued)
  • Pros
    • Attaches to most computers and iPads
  • Cons
    • Connection issues
    • Training
    • Expensive
    • Maintenance
    • Cannot display math or graphics

Accessing Print Tactually

• Refreshable Braille Displays (continued)
  • Points to Consider
    • Does this device give the student access to the same materials as his or her peers?
    • Is the student motivated to use the refreshable Braille display
    • Is this the best tool for the student for now or in the future.
Accessing Print Tactually

- Braille Translation Programs and Braille Printers
  - Examples
    - Duxbury
    - Braille 2000
    - Mega Dots
    - Tiger Braille Translation Suite
  - Price Range - $300.00 - $600.00

Accessing Print Tactually

- Braille Translation Programs and Braille Printers (continued)
  - Pros
    - Allows school work to be translated from print to Braille and embossed on a Braille printer for student access.
    - Supports all commercial Braille embossers.
    - Tiger software supports graphics.
Accessing Print Tactually

- **Braille Translation Programs and Braille Printers (continued)**
  - **Cons**
    - Requires add-on software for math translation.
    - Often does not translate perfectly.
    - Translation needs to be checked by someone knowledgeable with Braille.
  - **Points to Consider**
    - Who will be responsible for the Braille translation?
    - Is this the most timely approach to accessing Braille?
    - Is the student a proficient Braille reader?
    - Will the student be responsible for Braille translation?

Auditory Access to Print

- **Recorded material**
- **Electronic Book Services**
  - **Examples:**
    - Bookshare
    - Learning Ally
    - National Library Services (NLS)
    - Library2Go
    - Podcasts and Webcasts
  - **Pros**
    - **Access to Electronic books**
      - Text books
      - Leisure Reading
      - Instant access through apps like Read2Go and Learning Ally.
Auditory Access to Print

- Recorded material
  - Electronic Book Services (continued)
    - **Pros continued**
      - Organization or individual membership options
      - Unlimited access to accessible books, textbooks, newspapers and magazines
      - Multi-model accessibility
    - **Cons**
      - Some books are only in auditory format
      - Not all books are accessible through various organizations.
      - Have to be knowledgeable on using all of the electronic book sources.
    - **Points to Consider**
      - Does the student need auditory access, visual access or both?
      - Is this a secondary or primary learning media for the student?

Auditory Access to Print

- Computer Screen Reading programs on PC’s and Macs
  - **Examples**
    - JAWS for PC.
      - Required by the state of Oregon for OAKS testing
      - Considered by many to be the gold standard in Screen Readers
    - NVDA for PC
    - Serotek for PC
    - VoiceOver for Macintosh
  - **Price for JAWS - $1,100.00**
Auditory Access to Print

- Computer Screen Reading programs on PC’s and Macs (continued)

**Pros**
- Updated frequently
- JAWS screen reading program is required for OAKS state testing.
- Some screen reading software is very powerful and programmable
- Most software works with refreshable Braille displays and Braille note takers.

**Cons**
- Some programs are expensive.
- Does not work with math or graphics
- Complicated to learn

Points to Consider
- Does the student have the ability to learn key combinations or gestures to navigate the computer?
- Is a screen reading program the best choice for the student?
- Is this the right choice for now and in the future?
- Will the student benefit from using a screen reading program?
Auditory and Visual access to printed material

- **IOS devices (iPad or iPod touch)**
  - Access to reading materials through the use of apps
    - Read2Go app
    - Learning Ally app
  - Access to handwriting, PDF annotation, typing, recording, and organizing
    - Notability app
      - Handwrite
      - Zoom
      - Type
      - Add Media

- **IOS devices (continued)**
  - Notability app continued
    - Access PDF’s
    - Auto-Sync
    - Record
  - EyeDecide app
    - a physician-based medical application designed to provide easy access to information, discussion, and current scientifically recommended eye treatments
    - View detailed anatomical illustrations and simulated 3D motion of the eye while exploring various conditions.
Auditory and Visual access to printed material

• iPad (continued)

  • Pros
    • iPad apps easily accessible by using gestures to open and manipulate apps.
    • Relatively Inexpensive
    • Easy to use
    • Always updating the apps that are available
    • Accessibility built-in to unit
      o Zoom
      o VoiceOver
      o Large text

• IOS devices (iPad or iPod touch continued)

  • Pros
    o Contrast accessibility
    o Speak Selections
    o Speak Auto-text
    o Mainstream, not specialized equipment

  • Cons
    • Damage
    • Desirable, (for stealing)
    • Loss
Auditory and Visual access to printed material

- IOS devices (iPad or iPod touch continued)

  - Points to Consider
    - An iPad is not the silver bullet.
    - At what age do you introduce the iPad?
    - Who is responsible for damage or loss?
    - What apps need to be downloaded
    - Who is responsible for updating the iPad?

Equipment and materials needed for OAKS Testing

- PC running Windows 7
- Duxbury Braille translation software
- Tiger Braille translation software
- Refreshable Braille Display
- JAWS version 12.0 Screen Reading software
- OAKS Secure Browser 6.0
- Wireless printer router or Noise Cancelling headphones
Equipment and materials needed for OAKS Testing

Equipment needed for testing

- Braille Embosser
- Refreshable Braille Display
- Student computer

Equipment and materials needed for OAKS Testing

Equipment needed for testing

- Student computer
- Refreshable Braille Display
Equipment and materials needed for OAKS Testing

Current technology solutions for students who are blind/visually impaired

• **Closing Thoughts**
  
  • A solution for one is not a solution for all.
  • Technology changes constantly and it is important to determine what assistive technology tool will help the student now and in the future.
  • Decisions should be based on an assistive technology assessment.
Blind and Visually Impaired Student Fund (BVIS)

- **BVIS Funding**
  - Funding is available for technology needed by students who are blind/visually impaired.
  - We recommend collaborating with regional programs and submitting a proposal. Each proposal should name the device, how much $$$ including shipping, and a brief rationale for how the device will be used.
  - Send proposals to:
    - Scott McCallum BVIS Fund Administrator, NWRESD
    - Phone number (503) 614-1260
    - Email: smccallum@nwresd.k12.or.us

References

References (continued)


References (continued)

Contact Information

- Blind and Visually Impaired Student Fund (BVIS)
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  - Scott McCallum, BVIS Fund Administrator, NWRESD
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