Welcome to the Accessible Technology Webinar Series

The Accessible Technology Webinar Series is sponsored by the Great Lakes ADA Center and the Pacific ADA Center, both members of the ADA National Network.

The Session is Scheduled to begin at 1:00 pm Central Time

We will be testing sound quality and other items periodically

How to Conduct a Workplace Computer Accessibility Assessment

Paul J. Schwartz, MSIE, ATP, RET, CPE
Stout Vocational Rehabilitation Institute
University of Wisconsin-Stout
221 10th Ave/101 VRB
Menomonie, WI 54751
715-232-2378
schwartzpa@uwstout.edu

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Stout Vocational Rehabilitation Institute
Menomonie, Wisconsin

SVRI

Stout Vocational Rehabilitation Institute

- Vocational Evaluation
- Placement
- Assistive Technology
- Benefits Counseling
- Research
- Education
- Training
- Assistive Technology

Course Objectives

- Develop knowledge of one methodology in computer access assessments
- Gain practical information through case studies
- Gain understanding of general access equipment
- Gain knowledge of access resources

Person-machine System

Perceived information	**Displays**
Information processing and decision making	**Internal equipment status**
Motor responses for control activation	**Controls**

person-machine interface
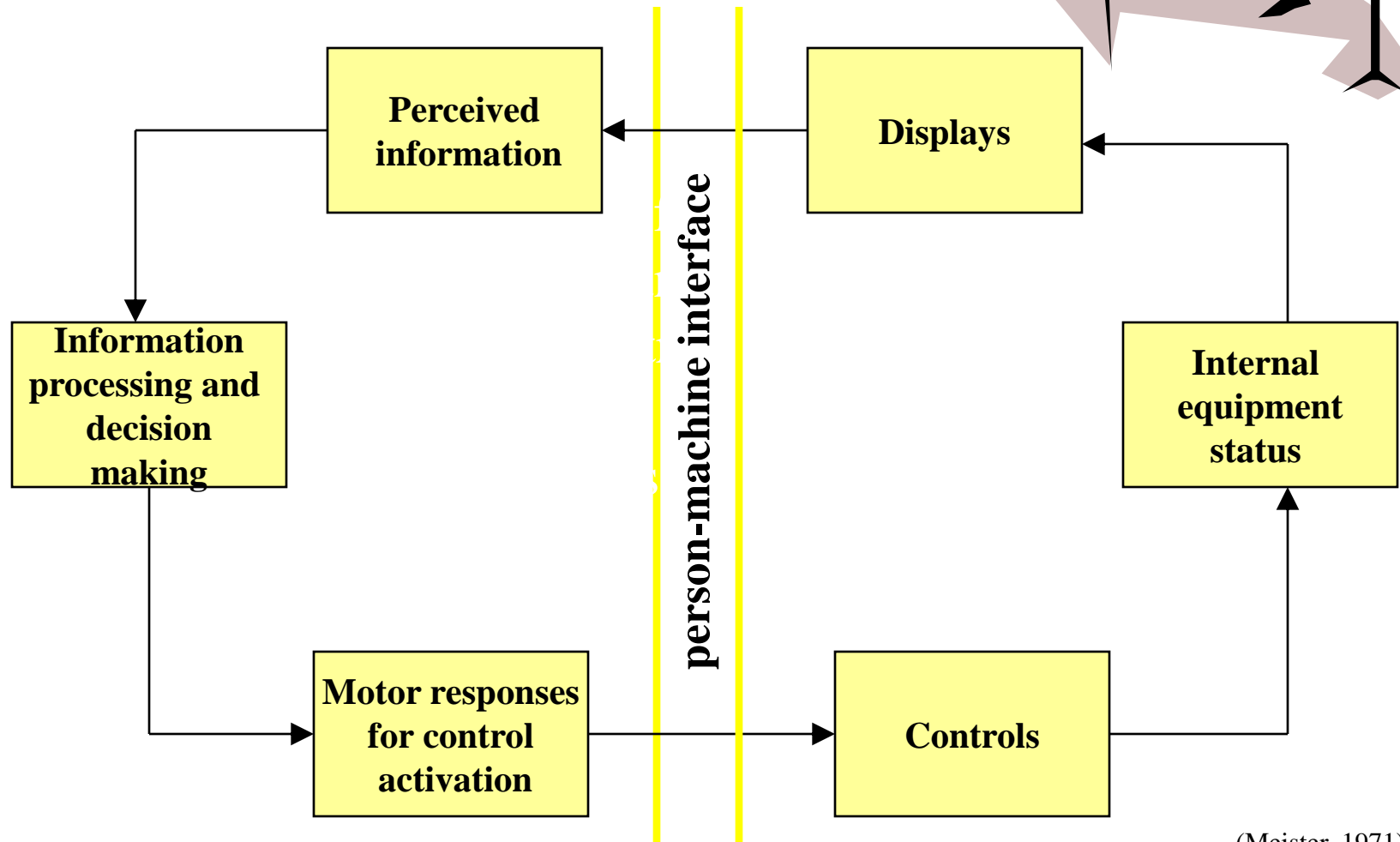
(Meister, 1971)

Accommodation Model
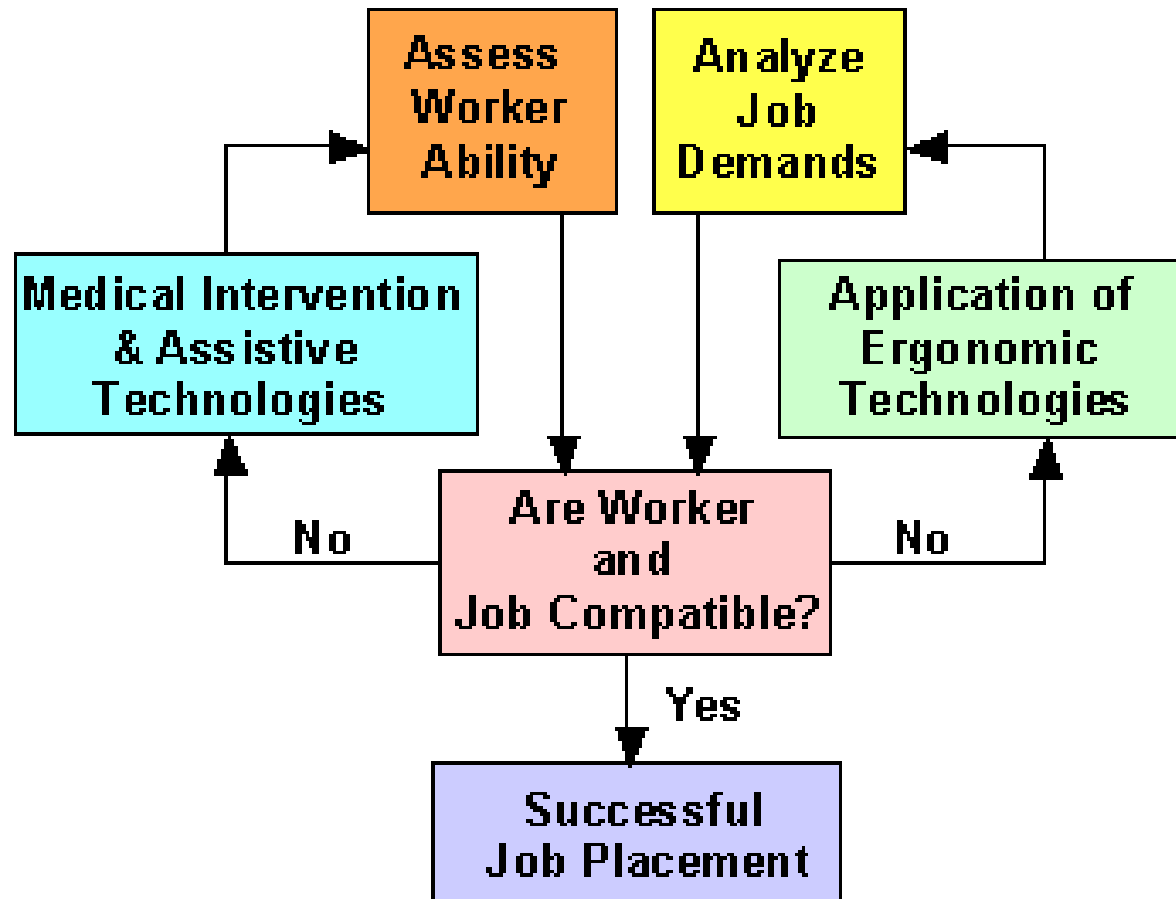
Assessment Components

- Regardless of model used, an assessment involves:
  - The individual
  - The environment
  - Their interaction

The goal of any computer access assessment is to evaluate the match between device characteristics and consumer skills and needs

-Cook and Hussey, 1995

Assistive Technology Problem Solving Process

Person's Abilities

Goal's Requirements

Identify Inconsistencies

Develop Objectives

Develop Specifications

Identify Possible Solutions

Identify Preferred Solutions

Persons Ability and ... Identify Inconsistencies 2. ...
Specifications
4. Indentify Possi...
5. Identified Preferred Solutions
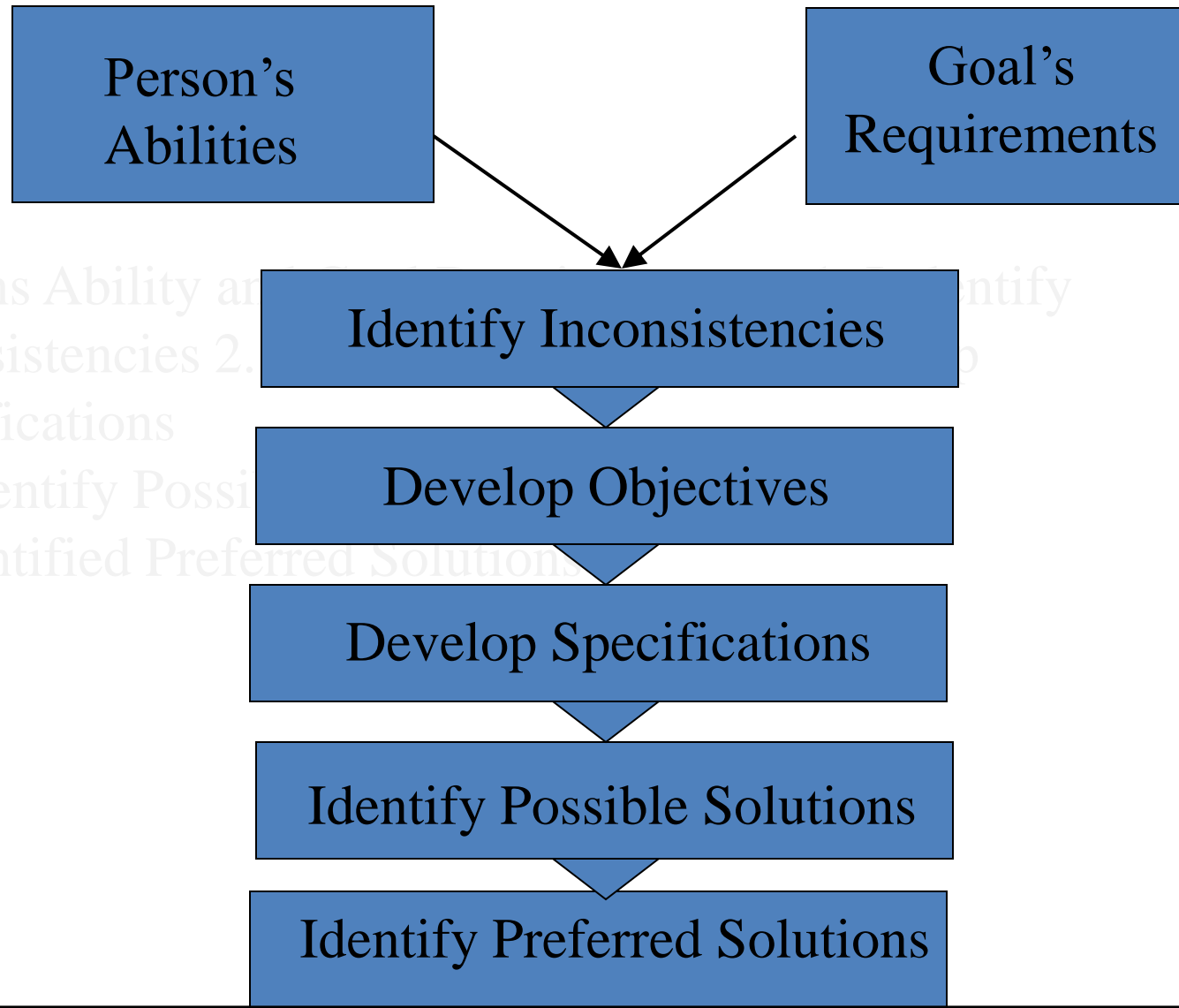
Assessment Process

1. Referral
2. Background information
3. Plan development
4. Interview with individual
5. Skills evaluation
6. Assessment wrap-up
7. Report
8. Follow-up

Referral

- Determine clearly defined objectives

- Request any available pertinent information

- Determine where assessment will take place and clarify funding

- Give timeline estimations for assessment process

Background Information

- Referral source objectives
- Diagnosis/prognosis
- Community/family contacts, if applicable
- Educational background and abilities

Background Information

- Specific concerns
- Previous experience with computers
- Previous assistive technology history
- Physical abilities (FCA, etc)

Skill Evaluation:
Use the Proper Equipment

Skills Evaluation

- Assess vision and visual perception
- Assess cognition
- Assess physical abilities/limitations
- Assess reaction to various technologies
- Tape measure, stop watch and goniometer are helpful

Skills Evaluation

- Assess frustration, tolerance, motivation
- Use quantifiable results as applicable (wpm, error rate, etc)
- Record what worked and *didn't* work

Clipart ima
using a stop

Assessment Wrap-up

- Clarify and review possible recommendations
- Verify consent forms, etc are signed, if applicable
- Discuss plan of action
- Clearly delineate who does what, when
- Discuss funding sources, if applicable

- Do you have any questions?

Reporting

- Summarize individuals skills
- Recommendations for AT
  - Include costs, vendors, etc as needed
- Think globally
  - Different solutions for different environments?
  - Don't neglect peripheral equipment
  - Does it fit in the work environment/family/school system
  - Portability needed?

Reporting

- Develop range of options, if applicable
- Detail need for technology in terms of injury or disability
- Consider backup systems
- Detail methods, equipment, purchase, configuration, setup, training, etc
- Who does what, when

Follow-up

- Implementation of plan

- Evaluation of access technique

- Phone calls

- Ongoing training

- Often an iterative approach

Assessing Computing Skills

- A good computer assessment goes much broader than the keyboard and mouse
- The environment beyond the physical contact with the computer is just as important as the input devices
- Any computer access assessment should begin with seating

Skill Assessment General Guidelines

- Start with simple solutions and move to complicated ones
- Stay on top of the products in the field or your recommendations will be quickly dated
- Develop ideas of pros and cons of products
- Have a range of possible solutions available or be able to fake them and get loaner later
  - "If all you have is a hammer, everything looks like a nail"

Skill Assessment General Guidelines

- You are concerned with function, but don't ignore aesthetics—if it looks too goofy, people will reject the technology

- Constantly monitor for reaction to technologies, frustration tolerance, motivation, perseverance and fatigue

- Trust, but verify on computer knowledge

Skill Assessment General Guidelines

- Timing and accuracy can be measured, but validity may be questionable due to learning curve of various technologies

- <u>Relax</u> and have a good time with the individual!
  - A nervous or hyper evaluator can lead to poor outcomes due to consumer stress, additional tone and reduced focus

Seating

- Correct seating is foundation for good function
- Should allow for range of positions
- Feet flat on the floor
- Weight divided between thighs and feet

Seating

- Adequate room behind knees
- Armrests as applicable
- Develop general understanding of wheelchair seating and use experts as needed
- For more information on seating, attend my class earlier today

Armrests

- Chair armrests are usually desirable
  - Help get out of chair
  - Add support and stability
  - Reduce load on back
- Armrests move with the chair and don't get in the way as table mount support (as much)
- May need optional armrest with width, angle and pitch adjustment

Arm Supports

- Provides more specialized support than armrests

- Articulating (mobile) arm supports can be helpful for those with good shoulder strength and weak lower arm

- "Butterfly" or fixed forearm supports can be helpful for those with spasticity, control issues or shoulder pain

- Both of these styles may impede other tasks

Workstations

- Generally, start around elbow height for keyboarding
  - This rule of thumb quickly breaks down for those with disabilities
- Factor in adequate room for other tasks, documents
- Maximize room for movement underneath
- Set at height of major activity (keyboarding vs. writing) or recommend both

Image
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Computer Access Technologies

- Keyboard modifications
- Keyboard alternatives
- Mouse modifications
- Mouse alternatives
- Output options

Keyboard Modifications

- Hardware modifications
  - Keyguards
  - Moisture guards
  - Tactile cues
  - Oversize letters
  - Color coded keys

Keyboard Modifications

- Software modifications
  - Sticky keys
  - Filter keys
  - Toggle keys
  - DVORAK layout
  - Letter by letter feedback

Dvorak Keyboard Layout

Keyboard Trials

- Can individual use a standard keyboard?

- Which hands? What fingers?

- Do they need elbow, forearm, or wrist support?

- Is the keying height correct?

Keyboard Trials

- Is the angle correct?

- Is the keyboard position correct?

- Can they use standard keyboard with mouthstick, stylus, headpointer or toes?

- Can they use standard keyboard with modifications?

- Do they need an alternative keyboard?

Alternative Keyboards

- "Ergonomic" keyboards
- Oversize or expanded keyboards
- Space saving and mini keyboards
- One-handed keyboards
- Other keyboards

Alternative Keyboards

- On screen keyboards

- Scanning keyboards

- Speech recognition

- Specialty items
  - Morse code
  - Tongue Touch Keypad (TTK)
  - Braille input

Ergonomic Keyboards

- Typically used for those with repetitive stress injuries
- Counterproductive for stick, stylus or one finger users
- Large variety of options available
- Most use QWERTY layout, so relatively quick learning curve
- Acceptance varies

Oversize Keyboards

- Typically used for those with gross motor skills, but limited fine motor
- Need to determine range of motion
- Need to determine speed and accuracy with various key size
- Smaller keys allow for more functions
- Can often be completely customized
- Can also be converted to big switches

Space Saving and Mini Keyboards

- Typically used for those with fine motor skills but limited range of motion or strength

- Can also be helpful in mouse or mouse alternative placement

- Reduces sweep area for

  mouthstick users

Other Keyboards

- "Dished" keyboards
  - Better positioning for mouthstick users
- Left-handed keyboards
  - 10 key and arrow keys on left
  - Sometimes helpful for mouse placement

One-handed Keyboards

- If used due to a repetitive stress injury, need to consider injury to second hand

- Range of options available

- Also consider learning one handed method on standard keyboard

- Acceptance is an issue

On Screen Keyboards

- Useful for those with extremely limited range of motion
- Used with a mouse or mouse alternative
- Can be activated by click or dwell
- Typically customizable
- Often comes with rate enhancement features
- Large monitor is helpful due to split screen

On Screen Keyboard
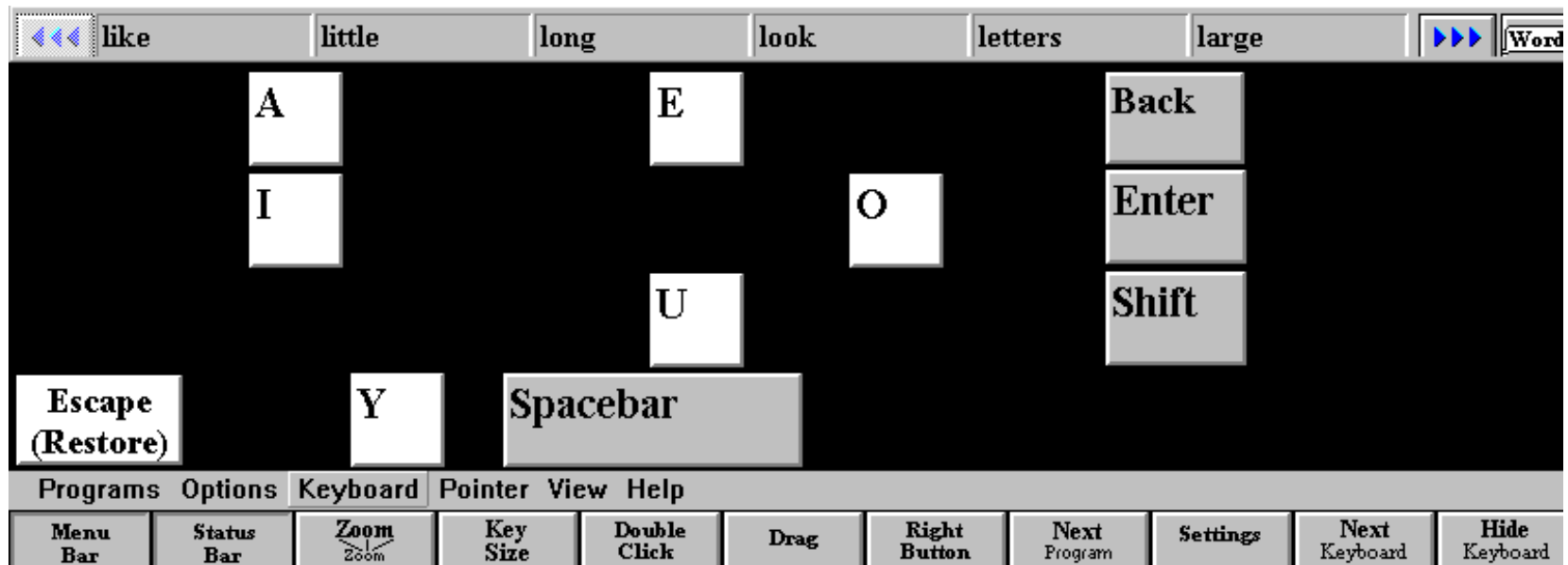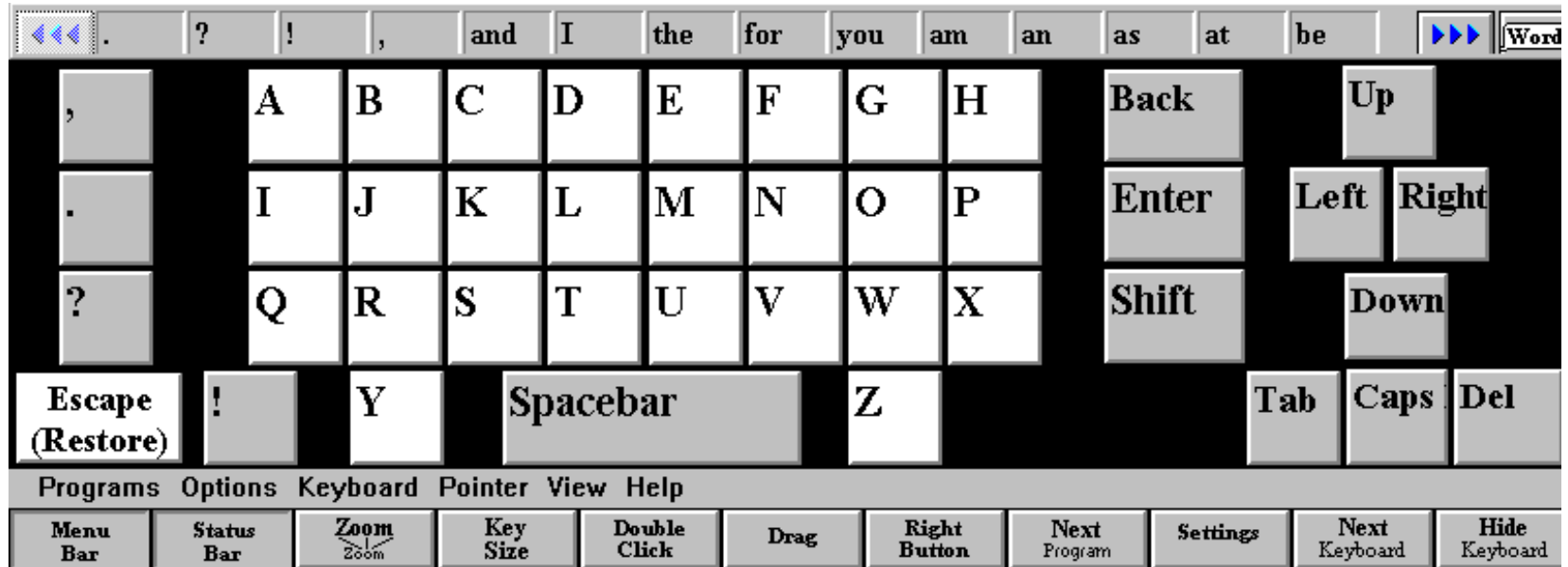
Scanning Keyboards

- Typically used for single or dual switch users
- It is very slow, avoid if possible
- Timing must be finely adjusted for optimal use
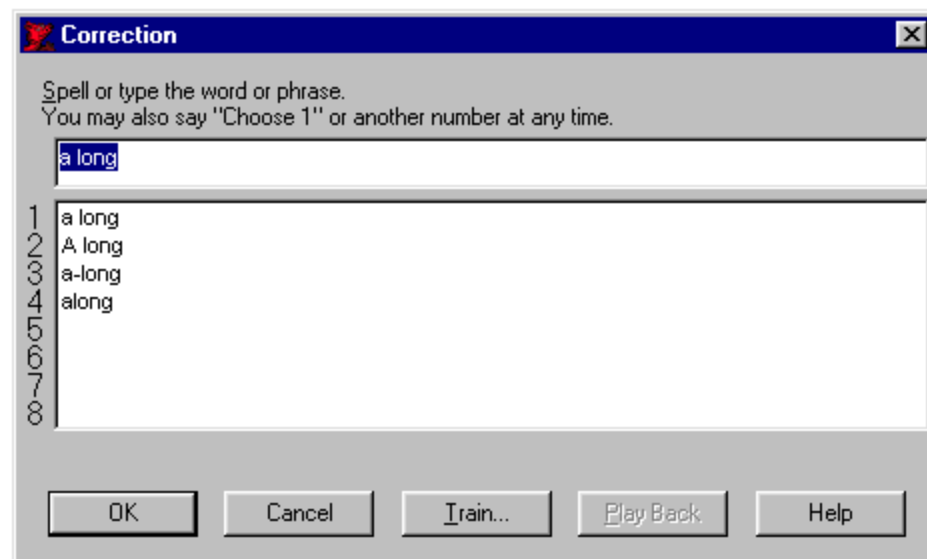- Often customizable

Speech Recognition

- Suggested by everyone

- Limitations generally not emphasized

- 95-98% accuracy for non-dysarthric speech

agonPad - Document

Edit   View   Format   NaturallySpeaking   Help

al (Western)   18   B I U   ≡ ≡ ≡   ≣

. . . 1 . . . 2 . . . 3 . . . 4 . . . 5 . . . 6 . . . 7 .

et's see how this works now.

peech recognition can sometimes drive you crazy!

hope these folks   don't realize that I have no idea what I am talking about
nd I am making this up as I go a long.

Correction

Spell or type the word or phrase.
You may also say "Choose 1" or another number at any time.

a long

1 a long
2 A long
3 a-long
4 along
5
6
7
8

OK   Cancel   Train...   Play Back   Help

Paul

Speech Recognition

- Microphone type and quality is important
- User needs
  - 6th grade reading skills (approximate)
  - Strong decoding skills
  - Strong motivation, frustration tolerance and perseverance
  - Significant training and support
- Need to consider backup and mice

Specialty Items

- Morse Code
  - fastest potential single, dual or triple switch use
  - requires good timing ability

- Tongue Touch Keypad
  - needs excellent tongue control
  - needs to be custom fit to roof of mouth
  - sophisticated technology

- Braille keyboard
  - portable solution for existing Braille user

Switch Considerations

- Positioning
- Activation motion
- Target size
- Force requirements

Switch Considerations

- Accuracy in timing

- Repeatability

- Durability

- Fatigue

- Ease of setup for support team

Mouse Trials

- Is the mouse at the proper height and position?

- Does the user need wrist or arm support?

- Can they point, click and drag with accuracy?

- Does it work in harmony with keyboard or do their spaces overlap?

Mouse Modifications

- Wide range of available mice

- Speed and acceleration adjustments

- Button arrangement

- Switch adapted mouse

Mouse Alternatives

- **Ergonomic mice**
  - Possibly better positioning
- **Trackballs**
  - Typically uses finger and wrist motion, minimizes shoulder movement
- **Joystick**
  - Can use power wheelchair control knowledge
- **Foot mice**
  - May create static load condition

Mouse Alternatives

- Mousekeys
- Trackpad/Trackpoint
  - Sometimes difficult to adjust to pad
  - Very small range of motion required
- Touch screen
  - Direct relationship with cursor movement
  - Good positioning is important
- Don't neglect keyboard shortcuts

Mouse Alternatives

- Hands free head mounted mouse
  - Good neck control required
  - Need sticker or device to be head mounted
- Mouth joystick
  - Good mouth and tongue control required
  - Needs to have finely tuned positioning
- Other mice alternative
  - Scanning mice software
  - Morse code

Rate Enhancers

- **Abbreviation expansion**
  - Requires motivation, pattern in typing is helpful
- **Word completion**
  - Despite keystroke savings, not always time savings (>3 wpm?)
  - May be helpful for fatigue or learning disability more than physical access issue
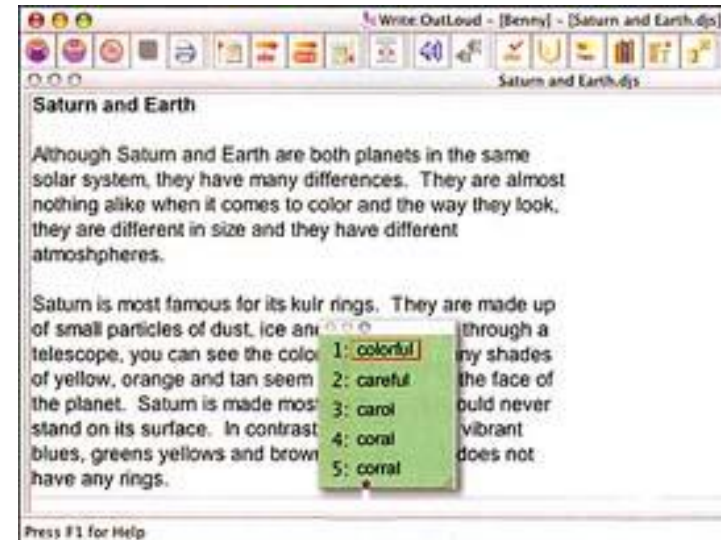
Rate Enhancers

- Macro software
  - Allows for many options for configuration
  - More helpful in business than school settings
- Macro keyboard
  - Dedicated keys can help high reuse items

Output Options

- Positioning monitor

- Consider bifocal vision

- Oversize monitor

- Glare screens

Output Options

- Text enlargement feature

- Screen enlarger

- Screen reader

- Text highlighter with reading

- Braille
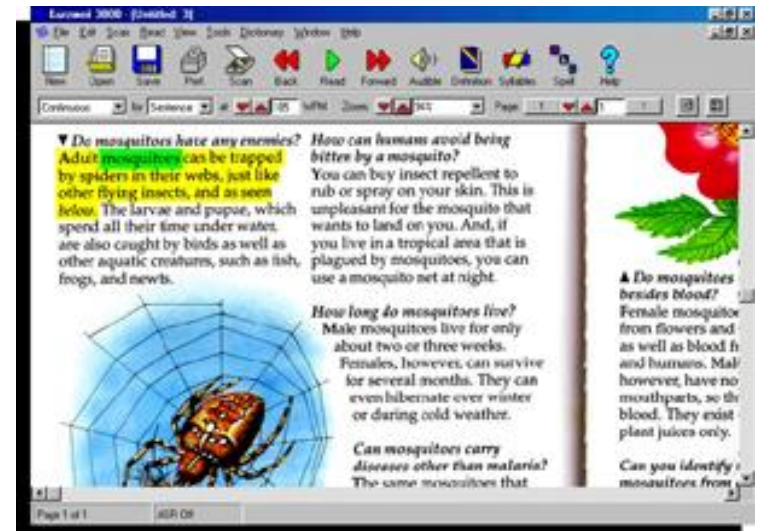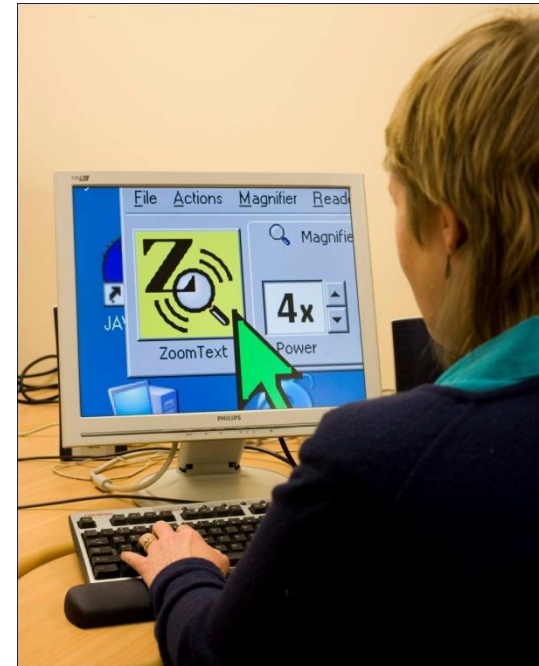
Case Studies

Assistive Technology Products

- Know your product categories, not just products
- Try them all yourself at trade shows
- Is it functional, or does it just look cool?
- "Ergonomic" chair (or several) and (quickly) adjustable height workstation are important

Assistive Technology Products

- Specific products to buy for assessments are based on consumer population
- Start simple and work your way up
- For big ticket items, how often will it be used?
    - Are you better off with loaner?
    - Buying and saving receipt?
- Less funding requires more creativity in assessment
    - May require mock-up session, then loaner session

Resources

- Great Lakes ADA Center
  - http://www.adagreatlakes.org/
- Job Accommodation Network
  - http://askjan.org/
- Catalogs i.e Alimed
- Conferences: RESNA, Closing the Gap, ATIA
- Websites
- Professional Organizations
- Listserves

Thank You

Please Evaluate the session at

ada-conferences.November92010.sgizmo.com

Next Session is January 11th 2011

Social Networking to Your Advantage with Speaker Tom Wlodkowski, Director of Accessibility at AOL