Accessible Computing Seminar

Lecture #4 – Assistive Technology

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What is Assistive Technology?

- **_Assistive technology_** is any item or piece of equipment or product system acquired commercially; off the shelf, modified, or customized, and used to increase, maintain, or improve functional capability for an individual with disabilities.

Technology-Related Assistanc for Individuals with Disabilities Act of 1988

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What is Assistive Technology?

- **AT can be low-tech**: *communication boards made of cardboard or fuzzy felt.*
- **AT can be high-tech**: *special-purpose computers.*
- **AT can be hardware**: *prosthetics, mounting systems, and positioning devices.*
- **AT can be computer hardware**: *special switches, keyboards, and pointing devices.*
- **AT can be computer software**: *screen readers and communication programs.*

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What is Assistive Technology?

- AT can be inclusive or specialized learning materials and curriculum aids.
- AT can be specialized curricular software.
- AT can be much more—electronic devices, wheelchairs, walkers, braces, educational software, power lifts, pencil holders, eye-gaze and head trackers, and much more.

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Who Can Benefit From Assistive Technology?

• People who most need assistive technology include:
  • people with disabilities
  • older people
  • people with noncommunicable diseases such as diabetes and stroke
  • people with mental health conditions including dementia and autism
  • people with gradual functional decline.

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Health, well-being and socioeconomic benefits

• Assistive technology can have a positive impact on the health and well-being of a person and their family, as well as broader socioeconomic benefits. For example:
  • Proper use of hearing aids by young children leads to improved language skills, without which a person with hearing loss has severely limited opportunities for education and employment.
  • Manual wheelchairs increase access to education and employment while reducing healthcare costs due to a reduction in the risk of pressure sores and contractures.

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Health, well-being and socioeconomic benefits

- Assistive technology can have a positive impact on the health and well-being of a person and their family, as well as broader socioeconomic benefits. For example:
  - Assistive technology can enable older people to continue to live at home and delay or prevent the need for long-term care.
  - Therapeutic footwear for diabetes reduces the incidence of foot ulcers, preventing lower limb amputations and the associated burden on health systems.

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Unmet Global Need For Assistive Technology

- Across the globe, many people who need assistive technology do not have access to it. Examples of the unmet global need for assistive technology include:
  - 200 million people with low vision who do not have access to assistive products for low-vision.
  - 75 million people who need a wheelchair and only 5% to 15% of those in need who have access to one.

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Unmet Global Need For Assistive Technology

- Examples of the unmet global need for assistive technology include:
  - 466 million people globally experience hearing loss. Hearing aid production currently meets less than 10% of the global need.
  - Lack of affordability in low-income countries is a major reason people in need do not possess assistive products.

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Unmet Global Need For Assistive Technology

- Examples of the unmet global need for assistive technology include:
  - Huge workforce shortages in assistive technology: over 75% of low-income countries have no prosthetic and orthotics training programmes. Countries with the highest prevalence of disability-related health conditions tend to be those with the lowest supply of health workers skilled in provision of assistive technology (as low as 2 professionals per 10 000 population).

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How Did Assistive Technology Evolve?

- 1973 - AT had not be formally defined, but was being used to assist students with disabilities.
- 1975 – Free Appropriate Public Education (FAPE) for students with disabilities – a right guaranteed by Section 504 of the Rehabilitation Act of 1973
- 1988 - AT was formally defined by the "Tech Act" of 1988 formally defined AT. Two specific areas related to AT were defined:
  - Assistive Technology Service
  - Assistive Technology Devices

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How Did Assistive Technology Evolve?

- 1990 - Tech Act" becomes "Individuals with Disabilities Education Act" (IDEA).
  - AT was mandated
  - Individual Transition Plans became part of Individual Education Plan (IEP).
  - **AT** devices had to be considered for all transition plans & part of IEP if considered necessary.
- American with Disabilities Act (ADA)
  - **AT** no long just part of education…extended into the public arena…..
  - No Discrimination against individuals with disabilities!

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How Did Assistive Technology Evolve?

- 1997 - **AT** reauthorized
  - Students with disabilities were now to be educated with their peers.
- 2004 - Individual with Disabilities Improvement Act passed…
  - **AT** defined within law for the first time!
  - Definition of **AT** did not change
  - Clarification was made regarding surgically implanted devices and replacement.
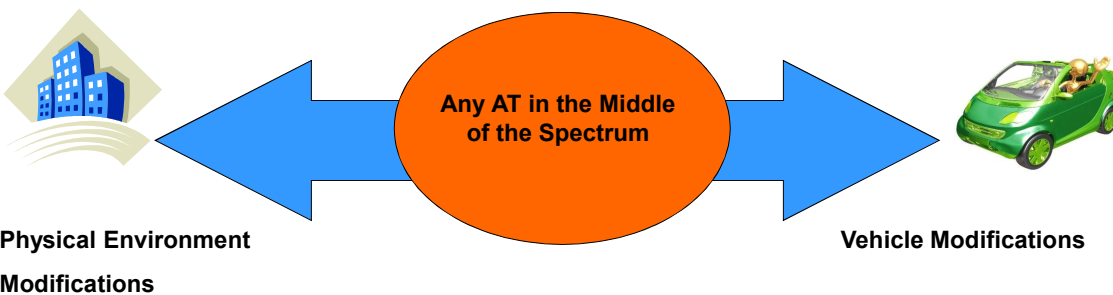
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Low-Tech Assistive Technology

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From No-tech, Low-tech to High-tech: Different Types of Page Turner ATs

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Spectrum of Assistive Technology

Any AT in the Middle of the Spectrum

Physical Environment Modifications

Vehicle Modifications

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High Tech Assistive Technology

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High-tech AT - Environmental Control Systems
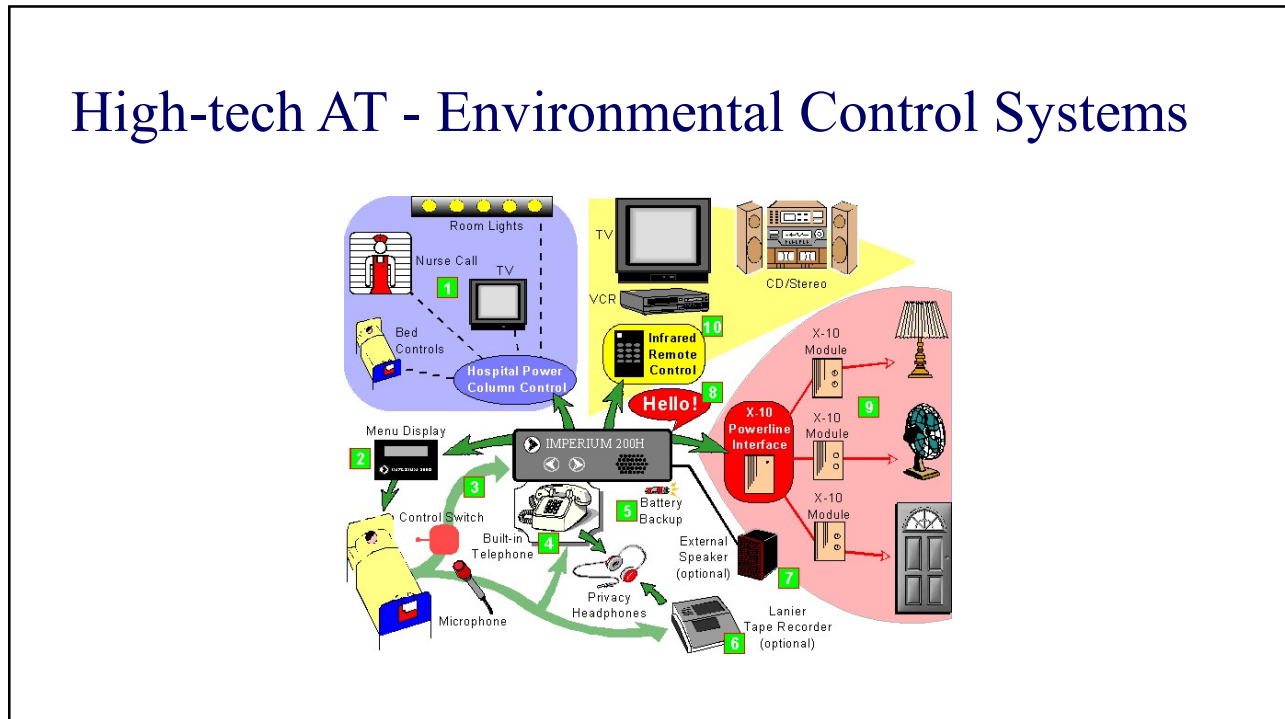
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Assistive Technology in the Classroom

Low-Tech
- Hard copies of notes provided by the instructor or other student
- Outlines, double spaced, with key words provided by the teacher or note taker
- Printed materials double-spaced and with larger print
- tape recorders
- Calculators with voice synthesizer
- Books on tape

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Assistive Technology in the Classroom

High-Tech
- Lap top computer for note taking
- Electronic spelling masters or dictionary with voice output
- Word prediction software
- Outline software
- Reading and scanning software
- Voice recognition software

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AT in the Classroom – Scanning and Reading
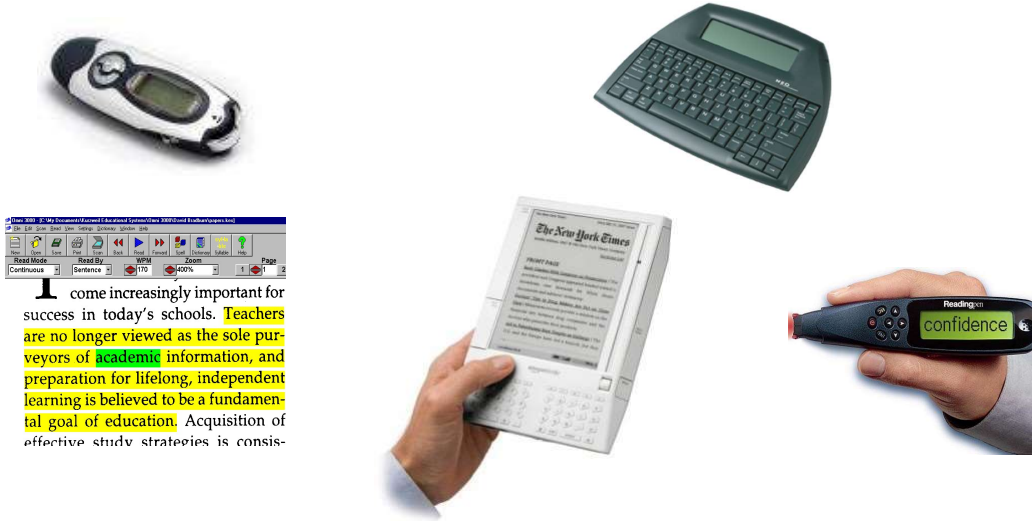
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AT in the Classroom – Writing Tools
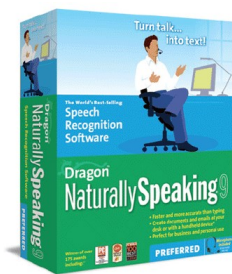
Voice Recognition

Writing Tool: outline and organize ideas

Word Prediction Software
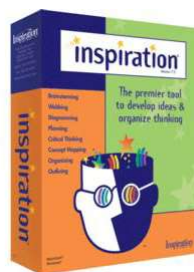
I w	I was
1 want	1 was
2 was	2 wasn't
3 would	3 was in
4 will	4 was a
5 went	5 was not
6 want to	6 was the

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AT in the Classroom: What about MATH?

Tech Matrix: developed by Center for Implementing Technology in Education and National Center for Technology Innovation at http://www.techmatrix.org/ .

Can select subject and types of supports needed.

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AT in the Service Environment

<u>Low-Tech</u>
- To-do lists
- Date planner (electronic or paper and pencil) and electronic reminders
- Color post-it notes
- Quiet space
- Telephone with headset
- Organized filing system
- Clip board

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AT in the Service Environment

<u>High-Tech</u>
- Alternative keyboards and mice
- Digital recorder
- Ergonomic desk, height adjustable tables
- Service-site modifications
- Reading and scanning software
- Voice recognition software

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AT in the Service Environments

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Microsoft Outlook Accessibility features

Microsoft Outlook Accessibility features
- Include alternative text with all visuals and tables.
- Add text to the images.
- Add hyperlink text and ScreenTips.
- Use accessible font format.
- Use accessible font color.
- Use bulleted list styles.
- Adjust space between sentences and paragraphs

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Accessibility in MS Outlook

- Get started using accessibility features in Outlook
- Use a screen reader to explore and navigate Outlook Mail
- Use a screen reader to explore and navigate Outlook Calendar
- Keyboard shortcuts for Outlook
- Basic tasks using a screen reader with email in Outlook
- Basic tasks using a screen reader with the calendar in Outlook
- What's new in accessibility for Outlook

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AT in the Service Environments

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Example of Work-Site Modification

Vocation: Metal Jewelry-Making

Adaptation: One-handed Operation

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AT for Daily Activities – Seniors and Independent Living

Low-tech
- Reacher
- Non-slip material
- Lever handles
- Slide or toggle switches
- Utensils with easy-grip handles
- Mirror mounted over the range

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AT for Daily Activities – Seniors and Independent Living

High-tech
- Clapper
- Universal remote control
- Home automation systems
- Environmental control systems
- Screen magnification software

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AT for Daily Activities – Seniors and Independent Living

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AT in the Home: More Environmental Control Systems

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