
Assistive Technology in Higher Education

Best Practices and Specific Examples

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Brief Overview

- Definitions and Examples
- Considering the Institutional Environment
- Deployment Models
- Management Strategies
- Hot Topic Issues
- Resources

The Right to Access

Students with disabilities have a right to full access.

Just as it is illegal to discriminate on the basis of skin color, ethnicity, religion, or gender, it is also illegal to discriminate on the basis of disability.

Educational institutions have a legal responsibility to not only prevent discrimination, but to ensure equal opportunities and promote full participation on the part of students with disabilities.

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Legal Mandates

Section 504 of the Rehabilitation Act (1973) and the Americans with Disabilities Act (1990) mandate that appropriate adjustments be made when an **otherwise qualified** individual who experiences a **documented disability** makes a **reasonable request** for accommodation.

Physical spaces, online materials, and learning environments must all be accessible to learners with and without disabilities.

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Accessibility as a Spectrum

Accessibility is not binary – It is seldom as clear cut as accessible vs inaccessible.

Instead, materials and environments are more or less usable for particular individuals depending on the method of access and level of access needed.

Best practices recognize this spectrum and keep movement focused on increasing usability, often by embracing a universal design approach.

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Providing AT in Higher Education

Section 504 of the Rehabilitation Act (1973) and the Americans with Disabilities Act (1990) both require that Educational Institutions provide auxiliary aids and services such as AT when appropriate.

[Handout from U.S. Department of Education Office for Civil Rights](#)

As defined in the Assistive Technology Act of 1988, AT is any "product, device, or equipment...used to maintain, increase, or improve the functional capabilities of individuals with disabilities."

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AT Examples/Demonstrations

Input

- ❑ Mice (Rollerball, Camera Operated, Magnification)
- ❑ Microphones
- ❑ Sip and Puff or other Switches
- ❑ Dasher or Onscreen Keyboards

Processing

- ❑ Optical Character Recognition
- ❑ Word Prediction
- ❑ Voice Recognition

Output

- ❑ Monitor or Paper in standard or large size
- ❑ Speakers or Headphones
- ❑ MP3
- ❑ Refreshable Braille

[Handout from DO-IT](#) and <http://www.ataccess.org/resources/atabook/>

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AT Examples/Demonstrations

Communication Aids

The Dubby is a speech synthesizer with a QWERTY keyboard



The Pocket Communicator is a handheld device that stores phrases that can be combined to form messages



Another approach is to use software that reads text out loud with a laptop computer

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AT Examples/Demonstrations

Assistive Listening Devices

The Pocketalker is a small portable device that works by amplifying sound picked up through a microphone and delivering it through earbuds.



An FM Listening system is a portable wireless listening system. In an educational setting a professor may wear a microphone and transmitter that sends his or her voice to a receiver equipped with earphones or a neck loop that works with students' hearing aids.



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AT Examples/Demonstrations

TTY, Video and Relay Calls



A TTY (teletypewriter) is a device that allows deaf, hard-of-hearing, or speech impaired people to communicate over the phone with another TTY user by keying in responses and reading what the other person types back.



With a high speed internet connection and computer webcam or specialized video phone, individuals can communicate directly with American Sign Language.

Relay services are free and allow for communication between a TTY or Video user and a traditional telephone user.

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AT Examples/Demonstrations

Speech to Text Services

Speech to Text Services provide realtime communication access for students who experience hearing loss. Services can be provided on-site or via distance delivery.

CART uses a steno machine (as in court reporting) and can be used for to produce a word-for-word transcript. Typewell and C-Print both use linked laptop computers and abbreviation software to produce a meaning-for-meaning transcript. Automatic Speech Recognition uses voice recognition software and although it is improving quickly it still requires quality control.

<http://www.typewell.com>

<http://www.ntid.rit.edu/cprint/>

<http://www.stsn.org/>

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AT Examples/Demonstrations

Speech Mike



The Philips Speech Mike contains a small trackball, programmable buttons, a trigger style click option, a speaker, and a microphone all in one ergonomically designed product.

It can be used with Voice Recognition software such as Dragon or ViaVoice.

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AT Examples/Demonstrations

Trackball Mice



This trackball has buttons that are flush to the sides of the unit. This means that the click can be activated with the forearm or elbow if needed. Users without fine motor control can use gross movements to control mouse movement and action.

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AT Examples/Demonstrations

Joystick Mouse

The joystick has click, double click, and drag switch options. The cursor will move in the direction the joystick indicates but with controlled movement. It will not go flying across the screen like a regular mouse.



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AT Examples/Demonstrations

Sip and Puff Joystick Mouse

The Jouse is a joystick-operated USB mouse that is controlled with the mouth or chin. Mouse clicks can be performed with “sip and puff” technology.



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AT Examples/Demonstrations

Head Mouse



A head mouse works by having a wireless optical sensor track a tiny target that is placed on the forehead or glasses of the user. This is especially useful with an on-screen keyboard.

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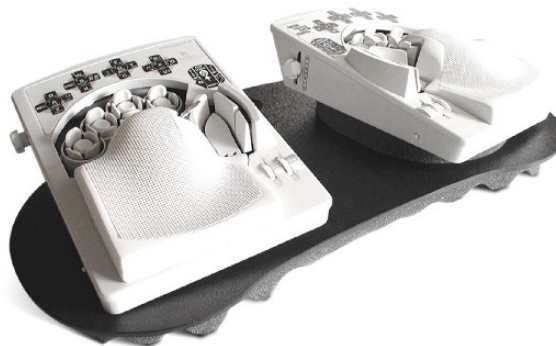
AT Examples/Demonstrations On-Screen Keyboard



Onscreen Keyboards often work in conjunction with word prediction software to cut down the number of keystrokes needed. They can be used with a variety of input devices such as head pointers, sip and puff switches, joysticks and mice.

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AT Examples/Demonstrations DataHand



DataHand is a unique option that provides for standard QWERTY keyboard action with minimal repetitive motion and magnetic switches for an extremely light touch.

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AT Examples/Demonstrations

Half Keyboards

For users who can use only one hand due to paralysis or injury this device can be very helpful. Additionally, it can be used by those who need to use their other hand with a stylus or other device.



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AT Examples/Demonstrations

Refreshable Braille Display

This refreshable Braille display can mount under a laptop and convert the text that is visually depicted on screen into Braille.

The Braille notetaker is a personal digital assistant (PDA) that uses a Braille keyboard for inputting information and refreshable Braille dots for reading. It also functions as a wireless braille display, connects to the Internet, reads email, writes email, and composes word processing documents.



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AT Examples/Demonstrations

Tactile Image Enhancer



The tactile image enhancer exposes flexi-paper, which is a plastic type paper that can be run through a standard office copier or marked with a soft lead pencil, to heat, and the dark parts swell. The pages are passed through the enhancer in a matter of seconds. There are also thermal pens that can be used with the flexi-paper.

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AT Examples/Demonstrations

Freestanding Readers

The Kurzweil Reading Edge or the Ovation Reading Machine are examples of stand-alone units that can scan and read documents out loud.

Users can listen with headphones or can plug the unit up to a recorder.



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AT Examples/Demonstrations

Magnifiers

A tabletop video magnifier enables a user to view a variety of objects, pictures, and printed materials. Settings usually include full color, black and white, or high contrast.



Lightweight and portable handheld devices can be used anywhere.



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AT and the Institutional Environment

Institution Type and Mission

- ❑ Public or Private
- ❑ Large or Small

Organizational Structure

- ❑ Who is best equipped to support AT?
- ❑ Does DSS and/or IT have funds/expertise?
- ❑ Is climate one of collaboration?

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Common Deployment Issues

Who will provide the funding?

- ❑ Does DSS have it's own budget?
- ❑ Are there Student Tech Fee funds?

Who will manage software licensing?

- ❑ Is networked licensing already used for other applications?
- ❑ Are there multiple campuses?
- ❑ Who will be responsible for troubleshooting issues that arise when conflicts occur and/or upgrades are needed?

Who will determine which AT is needed and provide training/support?

- ❑ Does IT have the necessary expertise?
- ❑ Does DSS have the necessary expertise?

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Centralized Deployment

Centralized Model Benefits

- ❑ With a designated AT Lab trainings can be grouped.
- ❑ Lab staff have AT expertise for troubleshooting.

Centralized Model Drawbacks

- ❑ It can be difficult to match the hours of operation available in other labs on campus.
- ❑ It can be difficult to ensure that there will be access to all the software from other labs.

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Distributed Deployment

Distributed Model Benefits

- ❑ AT can be made available in any existing lab.
- ❑ The lab hours and availability are consistent for all students with or without disability.

Distributed Model Drawbacks

- ❑ Labs are maintained by departments who may not be knowledgeable in troubleshooting AT issues.
- ❑ Providing training and support can be difficult.

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Hybrid Deployment

Hybrid Model Benefits

- ❑ A centralized lab is staffed by those who have specialized expertise for training and troubleshooting.
- ❑ There are additional accessible stations distributed across campus to increase hours of availability.
- ❑ AT is placed in other labs as requested to provide access in labs with specialized software.

Hybrid Model Requirement

- ❑ Effective Collaboration

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AT Management

In addition to decisions regarding the method of deployment – centralized, distributed, or hybrid – there are questions regarding scope.

- ❑ Who will have access - just students with disabilities, all students, the entire campus/community?
 - ❑ Will training be offered - if so, individual or group?
 - ❑ Will equipment be available for check-out – if so, how will the risk of loss be handled?
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AT Hot Topics

There are a number of areas in which AT planning is intersected by other key issues.

Having someone who is knowledgeable in AT provide input by serving on boards and councils can help avoid costly retrofits and ensure equal access.

Examples of Hot Topic Areas include:

- ❑ Web Accessibility
 - ❑ Distance Education
 - ❑ Alternate Media Formats
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AT and Web Accessibility

While colleges and universities are not required to create accessible web sites under section 508, the Office of Civil Rights has clarified that Educational Institutions must "effectively communicate" website content to individuals with disabilities under Section 504 and the ADA. This means that the information on those websites must be accessible in some format.

It is usually easier to create an accessible site than to provide all the same information in another equally effective format.

www.washington.edu/accessit/webpslegal.html

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Web Accessibility Cont.

There are clear guidelines and standards for ensuring web accessibility and clear benefits for institutions who embrace these standards.

- Accessible web content will reach audiences who use assistive and/or emerging technologies
- Use of structural tags and accessible templates will result in faster loading times and easier site maintenance

Demonstration of AccessIT mock university site

<http://www.washington.edu/accessit/AU/>

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AT and Distance Education

Distance Education takes many forms and while the accommodation process can address individual barriers as they are identified, a proactive approach can minimize that need.

Distance education can be a powerful option for many students including those who experience disabilities. Distance Ed can be accessible for those who rely on AT if designed well from the start.

When content is not designed to be accessible then accommodation must be made and this is generally more costly and takes longer than designing for accessibility from the start.

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Distance Education Example

Content is often loaded into a course management tool like Blackboard. While these management tools themselves often afford basic accessibility, the content that is loaded may or may not be accessible.

- ❑ Electronic text that is designed well can be magnified, read out loud, or converted to Braille
- ❑ Images that are tagged with text descriptions can be accessed by users using screenreaders
- ❑ Audio/Video that is captioned can be accessed by those who can not hear, have no speakers, or who are in a noisy environment
- ❑ Demonstration with PDF

[Handout on Adobe PDF creation and access](#)

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AT and E-Text

Assistive Technology is often used to access alternate format materials and e-text is an increasingly common format.

Many institutions have developed or are developing policies and best practices to deal with alternate format material provision in general and e-text in particular.

Handout

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In summary...

Some AT will be the responsibility of the student, and some will be the responsibility of the institution.

There are different models for deploying AT on campus (Centralized, Distributed, Hybrid).

There are different methods of managing AT on campus (DSS, IT, Collaborative).

There are hot topics relevant to AT planning.

There are benefits to developing a plan.

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Benefits of Establishing AT Policy

Student Success and Student Retention

- ❑ Students must have equal access in order to have an equal opportunity to succeed.
 - ❑ Technology that provides equal access for students with documented disabilities often provides additional benefits for a wide range of students without disability.
 - ❑ When a campus is aware of issues that arise for students using AT, and steps are taken to ensure accessibility for that population, those steps often benefit students without disabilities as well.
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Benefits of Establishing AT Policy contd.

Student Development

Students who learn to use AT while in class will also know how to use those tools and techniques while on the job or functioning as a member of the community.

Institutional Reputation

Members of the community who are in key positions to endorse the institution as a good choice for students with disabilities see a proactive, student-centered approach that supports appropriate uses of AT.

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Rights and Responsibilities Recap

Students have a **RIGHT** to full and equal access as well as a **RESPONSIBILITY** to make reasonable requests and provide their own personal devices when appropriate.

Institutions have a **RESPONSIBILITY** to provide reasonable accommodation for all otherwise qualified individuals, as well as a **RIGHT** to determine how equal access will be ensured.

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AT Planning in Context of UD

Letter of the Law *Accommodation Process*

If an institution is anticipating only “average” students then adaptive software like screenreaders or voice recognition may not be available until a student who is eligible makes a formal request for accommodation, at which point the institution must find a way to meet the need in a timely and effective manner.

Spirit of the Law *Universal Design Approach*

If an institution is anticipating a diverse population of students then adaptive software may be made available as a part of the policy for technology access. Students with and without disabilities will benefit from the beginning.

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AT Resources

State Assistive Technology Centers

<http://www.resna.org/taproject/index.html>

List of all the state assistive tech projects; grant-funded projects whose purpose is to provide info, access, funding options, advocacy re: use of/access to assistive technology.

[Handout with Additional Resources](#)

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Universal Design Resources

Center for Applied Special Technology Web Site:

<http://www.cast.org>

Center for Universal Design at NC State University Web Site:

<http://www.design.ncsu.edu/cud>

DO-IT Faculty Page Web Site:

<http://www.washington.edu/doi/Faculty/Strategies/Universal>

University of Connecticut, Center on Postsecondary Education and Disability Web Site: <http://www.facultyware.uconn.edu>

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AHEAD Resources

The Association on Higher Education and Disability (AHEAD) is the premiere professional association committed to full participation of persons with disabilities in postsecondary education.

AHEAD has Special Interest Groups as well as resources and publications on a variety of topics.

www.ahead.org/about/SIGs/technology/faq.htm

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Presenter Contact Information

All information presented in this session is available in hard copy or alternate format. Please contact me directly with questions or concerns:

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