# Real Connections: Making Distance Learning Accessible to Everyone

**Program practices to ensure access to students with disabilities**
by Sheryl Burgstahler, Ph.D.

Distance learning has been around for a long time. For years instructors have taught students across great distances via correspondence courses using printed materials. The early days of television witnessed the introduction of televised courses. Today, an instructor can videoconference with several classrooms full of students. Early online courses using email were rapidly followed by web-based instruction. Today, the lines are blurred between different types of distance learning courses as multiple modes of delivery are employed in a single course. For example, a class "library" could be a website; class discussions could take place using a message board; some course content could be delivered using online materials and videos.

Access to more students is a common reason given for providing instruction in a distance learning format. However, these access arguments usually focus on people separated by distance and time and often do not include consideration of the needs of people with disabilities. In fact, the design of many distance learning courses erects barriers to the full participation of students and instructors with some types of disabilities.

Ensuring that individuals with disabilities can participate in distance learning courses can be argued on ethical grounds. Many people simply consider it to be the right thing to do. Others are more responsive to legal mandates. The Americans with Disabilities Act (ADA) of 1990 and its 2008 amendments mandate that no otherwise qualified individuals shall, solely by reason of their disabilities, be excluded from participation in, be denied the benefits of, or be subjected to discrimination in public programs. The ADA applies to Internet-based programs and services. Clearly, distance learning programs must make their offerings available to people with disabilities who are eligible to take a class.

The following paragraphs discuss access issues and present design considerations for ensuring that a course is accessible to potential instructors and students with a range of abilities and disabilities. The field of universal design provides a framework for this discussion.

## Access Barriers

Thousands of specialized hardware and software products available today allow individuals with a wide range of abilities and disabilities to productively use computing and networking technologies. If a prerequisite to a course is Internet access, administrators and instructors can assume that any student enrolled will have access to the assistive technology they require. However, assistive technology alone does not remove all access barriers. Described below are examples of access challenges in distance learning courses faced by students and instructors who have access to assistive technology.

**Blindness**
A student or instructor who is blind may use a computer equipped with text-to-speech software. Basically, this system reads, with a synthesized voice, whatever text appears on the screen. He cannot interpret graphics (including photographs, drawings, and image maps) unless text descriptions are provided. Printed materials, videos, presentations, and other visual materials also create access challenges for him. These barriers can be

overcome with alternate media such as accessible electronic text, and text-based descriptions.

**Other Visual Impairments**
A student or instructor who has limited vision can use special software to enlarge screen images. He may see only a small portion of a web page at a time. Consequently, he can easily become confused when web pages are cluttered and when layouts change from page to page. Standard printed materials may also be inaccessible to him; he may require large print or electronic text that his system can enlarge for him. Individuals who are colorblind cannot successfully navigate web pages that require the user to distinguish some color combinations.

**Specific Learning Disabilities**
Some specific learning disabilities impact the ability to read, write, or process information. A student with a learning disability may use a speech output or screen enlargement system similar to those used by people with visual impairments. She may have difficulty understanding websites when the information is cluttered and when the screen layout changes from one page to the next.

**Mobility Impairments**
A student or instructor with a mobility impairment who cannot move his hands may use an alternative keyboard or speech input to gain access to online course materials and communication tools. Another student or instructor may be able to use standard input devices, but lack the fine motor skills required to select small buttons on the screen. If his input method is slow, a person with a mobility impairment may not be able to effectively participate in synchronous

(real-time) communications. If any place-bound meetings are required in a distance learning course, a participant with a mobility impairment may require that the location be wheelchair-accessible.

**Hearing Impairments**
Most Internet resources are accessible to people with hearing impairments because these resources do not require the ability to hear. However, when websites include audio output without providing text captioning or transcription, a student who is deaf is denied access to the information. Course videos that are not captioned are inaccessible to this student. He may also be unable to participate in a telephone conference or videoconference unless accommodations (e.g., sign language interpreters) are provided for that part of a distance learning course.

**Speech Impairments**
A student with a speech impairment may not be able to effectively participate in interactive telephone conferences or videoconferences. However, modes of participation that do not require the ability to speak, such as email, are fully accessible.

**Seizure Disorders**
Attention-grabbing flickers, at certain rates (typically between 2 to 55 hertz), can induce seizures for people who are susceptible to them. They should be avoided.

## Universal Design
The design of a distance learning class can impact the participation of students and instructors with visual, hearing, mobility, speech, and learning disabilities. Planning for access as the course is being developed is much easier than creating accommodation strategies once a person with a disability enrolls in the course or applies to teach it.

Universal design (UD) is defined by the Center for Universal Design (CUD) at North Carolina State University as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (*http://www.ncsu.edu/ncsu/design/cud/*). At the CUD, a group of product developers, architects, environmental designers, and engineers established a set of principles of universal design to apply in the design of products, environments, and communication and other electronic systems. General principles include the following: the design is useful to people with diverse abilities; and the design accommodates a wide range of individual preferences and abilities; the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

UD principles and strategies have been applied to libraries and other educational products and environments. Consult *The Center of Universal Design in Education* (CUDE) at the University of Washington (*www.uw.edu/doit/CUDE/*) for detailed information about UD.

When UD principles are applied, products meet the needs of potential users with a variety of characteristics. Disability is just one of many characteristics that an individual might possess. Others include height, age, race, native language, ethnicity, and gender. All potential characteristics of participants should be considered when developing a distance learning course. Just as modern sidewalks and buildings are designed to be used by everyone, distance learning designers should create learning environments that allow all potential students and instructors to fully participate.

The next sections of this publication provide examples of strategies for making distance learning courses welcoming, accessible, and usable to everyone. Be sure to include a statement on all promotional materials about how to obtain materials in alternate format and other disability-related accommodations.

## On-Site Instruction

The interactive video sessions, proctored examinations, and retreats for students in some distance learning courses require place-bound meetings. In these cases, the facility should be wheelchair accessible. The furniture should be flexible enough to accommodate wheelchair-users and accessible restrooms and parking should be available nearby. Standard disability-related accommodations, such as sign language interpreters, should be provided when requested. Instructors should speak clearly; face students when speaking to facilitate lipreading; and read aloud and describe text and other visual materials for those who cannot see them.

## Internet-Based Communication

Some distance learning programs employ real-time communication in their courses. In this case, students communicate synchronously (at the same time), as compared to asynchronously (not necessarily at the same time). Besides providing scheduling challenges, synchronous communication is difficult or impossible for someone who cannot communicate quickly. For example, someone with a learning disability who takes a long time to compose her thoughts or someone whose input method is slow may not be fully included in the discussion. In addition, some synchronous software erects barriers for individuals who are blind. Instructors who choose to use synchronous tools should plan for an alternate method of communication (e.g., email) when not all students in a group can fully participate using thr synchronous tool.

Text-based, asynchronous tools such as email, message boards, and email-based lists generally erect no special barriers for students with disabilities. If a prerequisite to a course is for students to have access to email, the instructor can assume that participants with disabilities already have an accessible email program to use. Email communication between individual students, course administration staff, the instructor, guest speakers, and other students is accessible to all parties, regardless of disability.

## Web Pages

Applying UD principles makes web pages accessible to individuals with a wide range of disabilities. Guidelines for making web pages accessible have been developed by the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C). W3C, an industry group that was founded in 1994 to develop common protocols that enhance interoperability and guide the evolution of the web, is committed to ensuring that the World Wide Web is fully accessible to people with disabilities.

There are basically two approaches for making web page content and navigation accessible. Certain types of inaccessible data and features need to be avoided or alternative methods need to be provided for carrying out the function or accessing the content provided through an inaccessible feature or format. For example, an online learning designer can avoid using a graphic that is inaccessible to individuals who are blind, or can create a text description of the content that is accessible to text-to-speech software.

Web pages for a distance learning class should be tested with a variety of monitors, computer platforms, and a web browser with the graphics and sound-loading features turned off (to simulate the experiences of people with sensory impairments). Testing to see if all functions at a website can be accessed using a keyboard alone is also a good accessibility test.

Course designers using learning management systems (LMSs; such as Blackboard, eCollege, and Canvas) can employ product accessibility tools to create accessible courses.

## Documents

Students who are blind or who have specific learning disabilities that affect their ability to read may require that printed and electronic documents (e.g., PDF, Word, PowerPoint) be available in accessible formats. Making the content of materials available in an accessible web-based format (HTML) may provide the best solution for students. Otherwise, consult resources to make specific files accessible. Prepare to make them in text-based formats with structured headings and the content of images described in alternative text.
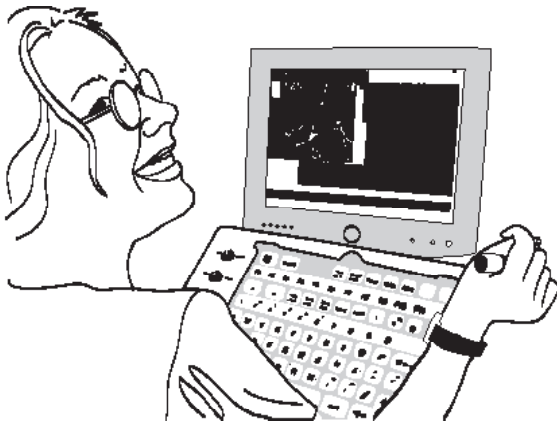
## Videoconference

Ideally, whenever a video presentation is used in a distance learning course, captioning should be provided for those who have hearing impairments and audio description (that describes aurally the visual content) should be provided for those who are blind. If a video publisher does not make these options available, the distance learning program should have a system in place to accommodate students who have sensory impairments. For example, the institution could hire someone local to the student to describe the visual material to a blind student or to sign audio material for a student who is deaf. Real-time captioning (developed at the time of the presentation) or sign language interpreting should be provided for videoconferences when requested by participants who are deaf.

## Teleconference

Sometimes, online courses include teleconferencing opportunities for discussion in small groups. This mode of communication creates scheduling challenges for everyone. It is also inaccessible to a student who is deaf. Instructors who use teleconferencing for small group discussions should allow alternative communication (e.g., email)

that is accessible to everyone in a specific group. Or, a student who is deaf might be able to participate in a teleconference by using the Telecommunications Relay Service (TRS), where an operator types what the speaker says for a student who is deaf to view on his text telephone (TTY) and translates his printed input into speech. However, this system might be too slow to allow participation in lively conversations. Another accommodation approach involves setting up a private chat room on the web. A transcriptionist types the conversation for the student who is deaf to view. The student can also type his contributions into the chat room and they can be voiced by someone in the group who is monitoring the chat room. Various options should be discussed with the student who needs an accommodation.

## Benefits of Accessible Design for People without Disabilities

People without disabilities may have temporary or situational constraints that are similar to those imposed by disabilities. For example, people who cannot access graphics due to computer system limitations are in a similar situation as students who are blind. A noisy environment that prohibits the use of audio features imposes constraints similar to those faced by students with hearing impairments. Those for whom English is a second language experience reading difficulties similar to those experienced by people with some types of learning disabilities. People who need to operate a computer but whose hands are occupied with other activities face challenges similar to those who use a hands-free input method because of a disability.

Applying UD principles assists both people with and people without disabilities. For example, using clear and simple language

and navigational mechanisms on web pages facilitates use by those whose native language is not the one in which the course is taught, as well as people with visual and learning disabilities. People who have turned off support for images on their browsers in order to maximize access speed, benefit when multimedia features provide text alternatives for the content, as do people who are blind and those who wish to use search tools to locate specific content. Similarly, people who cannot view the screen because they must attend to other tasks benefit from text-to-speech systems used by people who are blind. Captions provided on video assist people who work in noisy or noiseless surroundings, people for whom English is a second language, and people who have hearing impairments. Making sure that information conveyed with color is also available without color benefits those using monochrome monitors as well as those who are colorblind. Providing multiple formats of information also addresses differences in learning styles.

## Getting Started

Distance learning programs should be proactive in making their courses accessible. Rather than wait until someone with a disability enrolls in a course to address accessibility issues, they should consider them as they plan the course. To get started, program staff can

- think about the wide range of abilities and disabilities potential students might have
- include information in promotional publications on how to request accommodations
- arrange wheelchair-accessible facilities for on-site instruction
- make sure media can be accessed using sight or hearing alone, and online content can be accessed with a keyboard alone

- adopt and enforce accessibility standards
- provide information about standards, training, and support to instructors and design staff
- use the accessibility features of an LMS
- periodically review and update standards, procedures, and support issues

For a list of ten indicators for accessible distance learning programs consult the publication *Equal Access: Universal Design of Distance Learning Programs* at *www.uw.edu/doit/equal-access-universal-design-distance-learning-programs.*

## Conclusion

Distance learning courses are designed to reach out to students from anywhere. If UD principles are used in creating these classes, they will be accessible to any students who enroll in them and any instructors who are hired to teach them. Designed correctly, distance learning options create learning opportunities for students with a broad range of abilities and disabilities. Designed poorly, they erect new barriers to equal participation in academics and careers. UD can bring us closer to making learning accessible to anyone, anywhere, at any time.
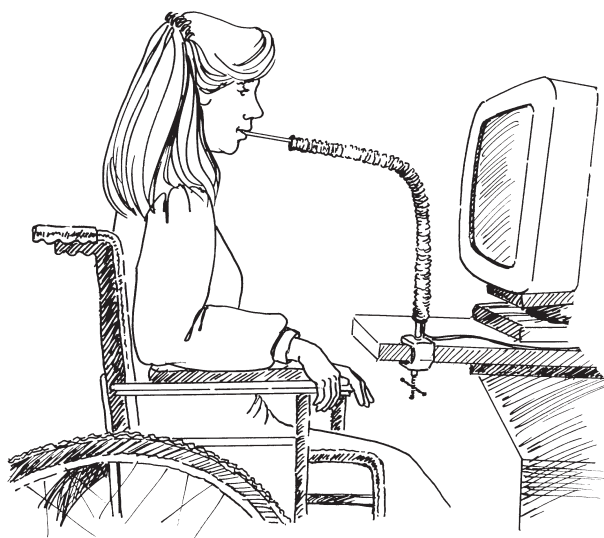
## Video

A short video presentation, *Real Connections: Making Distance Learning Accessible to Everyone*, demonstrates key points summarized in this publication. It may be freely viewed online at *www.uw.edu/doit/videos/index.php?vid=22* or purchased in DVD format. Permission is granted to reproduce DO-IT videos and publications for educational, noncommercial purposes as long as the source is acknowledged.

## Additional Resources

The following resources are useful to those who wish to research this topic further.

*AccessDL* (The Center on Accessible Distance Learning)
*www.uw.edu/doit/programs/accessdl*

Americans with Disabilities Act of 1990
*www.ada.gov/pubs/ada.htm*

CAST (Center for Applied Special Technology)
*www.cast.org*

The Center for Universal Design
*www.ncsu.edu/ncsu/design/cud/*

The Center for Universal Design in Education
*www.uw.edu/doit/programs/center-universal-design-education/overview*

Closing the Gap Resource Directory
*www.closingthegap.com*

Creating Video and Multimedia Products that are Accessible to People with Sensory Impairments
*www.uw.edu/doit/creating-video-and-multimedia-products-are-accessible-people-sensory-impairments*

EASI (Equal Access to Software and Information)
*easi.cc*

Equal Access: Universal Design of Distance Learning Programs
*www.uw.edu/doit/equal-access-universal-design-distance-learning-programs*

IMS Guidelines for Developing Accessible Learning Applications
*www.imsglobal.org/accessibility/accessiblevers/index.html*

SNOW (Special Needs Ontario Window)
*snow.idrc.ocad.ca/*

Trace Center
*www.trace.wisc.edu*

W3C, Web Content Accessibility Guidelines 2.0
*www.w3.org/TR/WCAG20/*

WebAIM—Web Accessibility in Mind
*www.webaim.org*

## About DO-IT

DO-IT (Disabilities, Opportunities, Internetworking, and Technology) serves to increase the success of individuals with disabilities in challenging academic programs and careers, such as those in science, engineering, mathematics, and technology. Primary funding for DO-IT is provided by the National Science Foundation, the State of Washington, and the U.S. Department of Education.

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