

# Universal Design of Distance and Online Learning

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## INTRODUCTION

Internet-based distance-learning courses have the potential to make learning opportunities available to anyone. This potential cannot be realized, however, unless everyone can truly access course offerings. People in rural areas and from poor communities are among those underrepresented in the group of people who benefit from new technological developments. The rapid development of assistive technology makes it possible for almost anyone to operate a computer (2006 Closing the Gap, 2006). Yet many individuals with disabilities do not have access to these empowering tools (Kay, 2000).

Some people with disabilities who have access to computers, assistive technology, and the Internet, still cannot fully participate in distance-learning courses because of their inaccessible design. For example, people who are blind often use text-to-speech systems that locate text that appears on the screen and read it aloud to the user. Because this technology cannot “read” graphics, it does not verbalize information embedded within graphic images. Therefore, people who are blind cannot access this content unless it is provided in a text-only format as well.

## BACKGROUND

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990 mandate that no otherwise qualified individuals with disabilities shall, solely by reason of their disabilities, be excluded from the participation in, denied the benefits of, or subjected to discrimination in public programs and services, unless it would pose an undue burden to do so. Such programs include distance-learning options offered by postsecondary institutions and other entities. A Department of Justice ruling (*ADA Accessibility*, 1996) clarified that accessibility requirements apply to programs offered on the Internet by stating, “Cov-

ered entities that use the Internet for communications regarding their programs, goods, or services must be prepared to offer those communications through accessible means as well.” Clearly, if qualified individuals with disabilities enroll in distance-learning courses or are qualified to teach them, these opportunities should be made accessible to them. However, the inaccessible design of many Web-based distance-learning courses erects barriers to people with some types of disabilities (Schmetzke, 2001; Waits & Lewis, 2003).

If a student who is blind accesses a Web-based course that does not have text descriptions of content embedded in graphic images, he will need special accommodations in order to access the content. Similarly, if an applicant who is blind is the best candidate to teach a Web-based course that has been developed without text alternatives for content displayed using graphics, the course will need to be modified in order for him/her to teach it. In both cases, if planning for access was done as the course was being developed, costly redesign and/or accommodations would not be necessary.

Simple design decisions can be made to ensure accessibility to potential students and instructors with a wide range of abilities and disabilities. Called “universal design,” this approach results in “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.” (Mace, n. d., p. 1) The concept of universal design was first applied to architecture, but has more recently been applied to the design of household appliances, Web sites, instructional techniques, and many other products and environments (e.g., Bar & Galluzzo, 1999; Bowe, 2000; Burgstahler, 2006c). By considering the wide range of characteristics of potential students and instructors during all stages of the course design process, distance-learning designers can create learning environments that are accessible to all participants, just as sidewalks with curb cuts are not only used by people who use wheelchairs, but also by people pushing delivery carts and baby strollers.

Few distance-learning programs have policies and guidelines that specifically address the accessibility of distance-learning tools and resources (Burgstahler, 2000; Kessler & Keefe, 1999; Schmetzke, 2001). Although it is rare for programs to have comprehensive accessibility policies, individual distance-learning courses have demonstrated that they can be designed for access to everyone, including individuals with disabilities. One such course, cotaught by the author of this chapter along with a professor who is blind, is described in the next section (Burgstahler).

The distance-learning designer can take an important step toward accessibility by simply using the most current versions of software. The current version of HTML (hypertext markup language), as well as commonly used development tools such as Blackboard™ (n.d.), include tools for accessible design. Software that can test Web resources for some accessibility features, as well as training courses and reference materials to help distance-learning designers develop skills for making distance-learning programs accessible, are also widely available.

## **MAIN FOCUS OF THE CHAPTER: GUIDELINES**

Two sets of accessibility guidelines are widely accepted nationwide, and can be used by distance-learning programs to direct their design of accessible courses. The Web Accessibility Initiative (WAI) of the World Wide Web Consortium developed Web Content Accessibility Guidelines (WCAG, <http://www.w3.org/WAI>). WCAG 1.0 included 14 guidelines that are general principles of accessible design; each guideline has one or more checkpoints that explain how the guideline applies in a specific area. The WCAG 2.0 working draft is organized around four design principles for Web accessibility:

- Content must be perceivable.
- Interface elements in the content must be operable.
- Content and controls must be understandable.
- Content should be robust enough to work with current and future Web technologies. (World Wide Web Consortium, 2006)

Section 508 of the Rehabilitation Act of 1973 requires that electronic and information technologies

that federal agencies procure, develop, maintain, and use are accessible to people with disabilities. The U.S. Architectural and Transportation Barriers Compliance Board (Access Board) developed Electronic and Information Technology Accessibility Standards (2000) to which federal agencies must comply. Although most distance-learning programs are not covered entities under this legislation, the Section 508 standards are useful as guidelines for designing accessible courses.

## **CASE STUDY: UNIVERSITY OF WASHINGTON (UW) DISTANCE LEARNING**

The following paragraphs describe the development of a distance-learning course designed to be fully accessible to students and instructors with disabilities. The section concludes with activities built on this early work, including the development of *distance-learning program accessibility indicators* that have been tested nationwide.

### **Development of the First Distance- Learning Course at the UW**

The University of Washington's distance-learning program was established in 1912. In 1995, the UW offered its first Internet-based distance-learning course, *Adaptive Computer Technology* (Burgstahler, 2000). It was designed for teachers, parents, service providers, and computer lab managers. It was offered for three Rehabilitative Medicine or Education university credits. The course surveyed the fields of assistive technology and accessible design and their impact on the lives of people with disabilities. Topics included legal issues, assistive hardware and software for accessing information technology, universal design, computer applications for people with disabilities, resources, and program implementation strategies. The course was cotaught by the author of this chapter and a professor, Dr. Norman Coombs, who is blind. The instructional tools for this course were Web-based materials, video presentations, electronic mail, and a discussion list.

### **Internet Communication**

Communication between students, course administrators, the instructor, and other students took place using e-

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