

Making distance learning courses accessible to students and instructors with disabilities: A case study

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Abstract

Worldwide, distance learning programs offer opportunities for education and career enhancement for those who have access to a computer and the Internet. However, some potential students and instructors who have access to these technologies cannot fully participate because of the inaccessible design of courses. These individuals include those with visual and hearing impairments. The University of Washington Distance Learning program and the campus unit that provides computer access for students and instructors with disabilities teamed up with DO-IT (Disabilities, Opportunities, Internetworking, and Technology), a national center that promotes the use of accessible technology, to improve the accessibility of the University's distance learning courses. The authors of this article discuss their ongoing efforts as well as lessons learned so that others might benefit from their experiences. They also provide an overview of access challenges and solutions for people with disabilities, legislation, accommodation and universal design approaches to accessibility, and standards and guidelines.

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1. Introduction

Correspondence courses using printed materials, postal mail, and television have brought together instructors and students separated by great distances for a long time. The Internet is the latest vehicle

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used to deliver these learning opportunities. Online courses, in the early days delivered via electronic mail, are now dominated by Web-based instruction (National Education Association, 2000; Technology Counts 2002; Waits & Lewis, 2003). The widespread availability and flexibility of this multimedia tool has led to an explosion of online learning offerings worldwide (Waits & Lewis, 2003). Although the ultimate goal of distance learning is to make education available to anyone anywhere at anytime, this goal cannot be realized unless courses are designed to be accessible to all potential students, including those with disabilities.

Online courses can inadvertently erect barriers for students and instructors with disabilities. Web pages with complicated navigation can be difficult for people with mobility impairments to use. Content within graphics images may be meaningless to someone who is blind. Words spoken in an audio clip are potentially unavailable to someone who is deaf. Some of these course features also present problems to nondisabled users who have slow connection speeds or are using older technology.

The Institute for Higher Education Policy (2000) conducted a study to distill best practices used by colleges and universities actively engaged in online learning. It identified benchmarks critical to the success of any successful online distance learning program. These benchmarks were grouped into seven areas—institutional support, course development, teaching/learning, course structure, student support, faculty support, and evaluation and assessment. Although disability-related issues are relevant to each of these benchmark categories, they were not explicitly discussed in the study. This is not surprising because, as a group, people with disabilities are among the least considered in the educational context of online learning (Kinash, Crichton, & Kim-Rupnow, 2004). This situation in combination with the following current conditions makes the accessibility of distance learning programs an important topic to address:

- the potential of accessible distance learning to level the playing field for people with disabilities;
- the inaccessible design of many current online learning courses;
- legislation that mandates program access and nondiscrimination with respect to people who have disabilities; and
- the potential of accessible design principles to improve distance learning outcomes for all students.

In the next sections, the authors provide a review of the literature related to the accessibility of online courses for individuals with disabilities. The review of the literature is followed by a case study that reports ongoing efforts of a university-based distance learning program to address accessibility issues in the context of benchmarks identified by the Institute for Higher Education Policy as critical to the success of all online programs. The authors share lessons learned that can be useful to other programs that embrace the goal of making Internet-based courses accessible to all students and instructors.

2. Review of literature

In the next sections, the authors of this article provide a review of issues, research, and practice related to access challenges and solutions for people with disabilities, as well as legislation, accommodation and universal design approaches to accessibility, and standards and guidelines.

2.1. Access challenges and solutions

The availability of a wide range of assistive technology makes it possible for individuals with almost any type of disability to gain access to computers and telecommunications technologies (Carlson, Ehrlich, Berland, & Bailey, 2001; Closing the Gap, 2004). For example, individuals who are blind often use text-to-speech systems that read what appears on the computer screen with a synthesized voice. These systems only provide access to the text content of Web pages, software, and other electronic resources. Text-based course tools such as electronic mail do not present accessibility challenges to people who are blind, but content embedded in graphics images is inaccessible unless text descriptions are provided. Individuals who cannot use a mouse can participate in a distance learning course only if it can be accessed with a keyboard alone.

Real-time chat communication, in which students communicate synchronously, is difficult or impossible to use by someone whose input method is slow, perhaps because of limited hand function or a learning disability, and some chat systems are not accessible to those who are blind. Therefore, it is important that an instructor who typically uses a synchronous tool such as chat is prepared to provide an accessible alternative, such as electronic mail, if a student who cannot use chat enrolls in a course. Similarly, when telephone conferencing is an option for small group discussions in a distance learning course, instructors should give students an alternative method (e.g., to conduct the discussion online using electronic mail) that is accessible to everyone in the group. Such an option assures that students who are deaf, are hard of hearing, or have speech impairments can participate in this course activity.

Avoiding some access barriers is simple. For example, text alternatives such as <alt> tags can be provided for graphics images in order for blind students and instructors to make sense of the content. A text-only version of the content of a PDF document also makes content of the document accessible to individuals who are blind. Likewise, captions on video and other multimedia products make content accessible to students who are deaf.

2.2. Legal issues

Section 504 of the Vocational Rehabilitation Act of 1973 (Vocational Rehabilitation Act, 1973), although it does not specifically address access to Internet-based educational offerings, mandates that qualified people with disabilities have access to programs and services that receive federal funds. The Americans with Disabilities Act (ADA) of 1990 (Americans with Disabilities Act, 1990) reinforced and extended Section 504, prohibiting institutions from excluding and otherwise discriminating against students with disabilities in public programs and services, regardless of whether or not they are federally funded (Edmonds, 2004). In 1996, the United States Department of Justice (Patrick, 1996, p. 1) clarified that the ADA accessibility requirements apply to programs offered on the Internet by stating: “Covered 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.” Specifically, if qualified individuals with disabilities enroll in online courses, these courses must be made accessible to them.

Section 508 of the Rehabilitation Act of 1973 (U.S. Department of Education, 1998), requires that electronic and information technologies that federal agencies procure, develop, maintain, and use be made accessible to people with disabilities, both employees and members of the public, unless it would pose an undue burden to do so. The Vocational Rehabilitation Act Amendments (1998) mandated the U.S. Architectural and Transportation Barriers Compliance Board (Access Board) to develop

accessibility standards for electronic and information technology to which federal agencies must comply. The standards list criteria that determine whether computers, software, videotapes, telephones, Web pages, or other technology is considered accessible (Architectural and Transportation Barriers Compliance Board, 2000). Section 508 directly applies only to federal agencies. This means that online learning courses that are procured, developed, or used by federal agencies must adhere to Section 508 standards.

2.3. Accommodations and universal design

Potential students in an online course may have mobility, visual, hearing, speech, and other types of disabilities that could impact their participation. Today, most programs only deal with accessibility issues when a student with a disability enrolls in the course; they provide accommodations. Planning for access as courses are being developed is easier and therefore less expensive than quickly developing accommodation strategies once a student with a disability enrolls in a course. The process of making more accessibility decisions while a course is being developed to assure that it will be accessible to potential students with a wide range of abilities, disabilities, learning styles, and other characteristics is called “universal design.”

Universal design is defined by the Center for Universal Design 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 (North Carolina State University, 1997). The Center established a set of principles of universal design (Anders & Fechtner, 1992). When designers apply these principles, physical environments, communications, and products they develop can be accessed by people with a variety of characteristics in categories that include height, age, race, ethnicity, gender, native language, and levels of ability to hear, see, move, and speak. When the range of characteristics of potential students is considered, distance learning course designers create learning environments where all students and instructors can fully participate, just as architects design buildings that can be used by those who walk independently, walk with crutches, push baby strollers, and use wheelchairs.

Although universal design has been applied to instruction (Bar & Galluzzo, 1999; Bowe, 2000), most articles and books about online course development do not discuss universal design or address specific access issues for people with disabilities (Schmetzke, 2001). There are few exceptions (Burgstahler, 1997; Waits & Lewis, 2003).

2.4. Standards and guidelines

The development of the Web Content Accessibility Guidelines by the World Wide Web Consortium (W3C) and the Section 508 standards for the federal government were both guided by universal design principles. The Web Content Accessibility Guidelines (W3C, 1999) tell how to design Web pages that are accessible to people with disabilities. More recently, in response to the Section 508 amendments, the Access Board created standards to be used by the federal government to assure the procurement, development, and use of accessible electronic and information technology, including Web pages (Architectural and Transportation Barriers Compliance Board, 2000). Some institutions that sponsor distance learning programs that are not strictly required to comply with Section 508 adopt the Section 508 standards or W3C’s guidelines (e.g., see <http://www.cew.wisc.edu/accessibility/guidelines/>

[uwMadisonPolicy.htm](#)); others develop their own list of accessibility requirements for their programs (see <http://standards.mivu.org/standards/access/>).

Distance learning programs can benefit from following the leadership of the federal government in being both proactive (by applying universal design principles) and reactive (by providing accommodations) rather than reactive-only regarding accessibility issues:

Use of an “ad hoc” or “as needed” approach to IT accessibility will result in barriers for persons with disabilities. A much better approach is to integrate accessibility reviews into the earliest stages of design, development, and procurement of IT (U.S. Department of Justice, 2000).

Steps toward assuring that an online learning program is accessible to everyone include the development of policies, procedures, guidelines, and dissemination methods, as well as the provision of ongoing training, technical support, and evaluation (Burgstahler, 2002). Comprehensive policies that address disability-related accessibility issues for online courses are rare (Schmetzke, 2001). In 1999, the California Community Colleges developed the first comprehensive distance learning guidelines in response to a 1998 ADA compliance review by the Office of Civil Rights (California Community Colleges Chancellor’s Office, 1999). The Distance Education Access Guidelines are for print media, audio conferencing video conferencing/video transmission, Web resources, and software. The Michigan Virtual University’s distance learning program provides a good example of how accessibility guidelines can be incorporated into policies and practices. The subsections of its Standards for Quality Online Courses are Technology, Usability, Accessibility, and Instructional Design. Based on the Web Content Accessibility Guidelines of the W3C (2003), the Accessibility subcategories include Basic Content, Tables/Frames, and Media.

Numerous published articles have evaluated the accessibility of Web pages at postsecondary institutions, including those of their distance learning programs. Most use Web Content Accessibility Guidelines or Section 508 as accessibility standards and use automated tools for testing. Results of these studies show that many Web sites erect significant accessibility barriers to individuals with disabilities (Thompson, Burgstahler, & Comden, 2003). Few studies address online learning courses specifically (Schmetzke, 2001) and only a few published works that discuss access issues for people with disabilities in Internet-based distance learning cover a wide range of technologies and strategies currently used in distance learning courses (e.g., Burgstahler, 2000; Kessler & Keefe, 1999). Not surprisingly, many online courses are not accessible to all people with disabilities.

In a recent study, although almost all postsecondary institutions reported using Web sites for distance education courses, only 18% indicated that they followed established accessibility guidelines to a major extent; 28% followed guidelines to a moderate extent, 18% followed guidelines to a minor extent, 3% did not follow guidelines at all, and 33% did not know if the Web sites adhered to accessibility guidelines (Waits & Lewis, 2003).

A resounding theme in the literature on online learning and people with disabilities of the past few years is that improving accessibility of online courses for students with disabilities promotes best practices in online learning for all students (Kinash et al., 2004; Opitz, 2002). Applying accessibility guidelines can benefit people without disabilities. For example, a student for whom English is a second language benefits from captions on video clips. A student working late at night may prefer to use a noiseless system while other members of the household are sleeping, creating a situation similar to that experienced by a student who is deaf and reaping benefits from captioned video clips. A student who cannot access graphics because of limitations of a computer system or an Internet connection faces

challenges similar to those of a student who is blind and benefits when text alternatives are provided for graphics. In general, providing multiple formats to present content addresses the needs of students with a variety of learning styles.

3. A case study: The University of Washington Distance Learning program

The University of Washington (UW) Distance Learning program, together with its project partners, the UW Access Technology Lab and DO-IT (Disabilities, Opportunities, Internetworking, and Technology), was selected for conducting a case study because of qualities that make its experiences of practical use to other institutions working to make their online courses accessible to students and instructors with disabilities. These characteristics include the following.

- The UW Distance Learning program has substantial experiences in offering Internet-based courses and offers an extensive set of courses, including online certificate programs.
- This program has wrestled with accessibility issues since its first Internet-based distance learning course was offered by a blind co-instructor and the course itself dealt with the accessibility of technology for people with disabilities (Burgstahler, 1997).
- The UW Distance Learning program has received a campus-wide award in recognition of its accessibility efforts and project partners have been recognized nationally by the Sloan Consortium (2004) for its efforts in making its courses accessible.
- In the 1980s, the Access Technology Lab (then called the Adaptive Technology Lab) received national attention as one of the first postsecondary adaptive technology services in the country.
- DO-IT earned the National Information Infrastructure Award (Appleman & Dangaard, 1996) and the Presidential Award for Excellence in Mentoring for its effective use of the Internet in creating an accessible electronic mentoring community for people with disabilities (NSF Press, 1997).
- The work is collaborative, involving several campus units whose counterparts can be found on many other campuses.
- The work has been recognized with the support of several large federal grants. They include funding from the National Science Foundation (Cooperative Agreement #HRD-0227995) and the U.S. Department of Education Office of Postsecondary Education (Grant #P333A02004), and Fund for the Improvement of Postsecondary Education (Learning Anywhere, Anytime Program grant (PR/Award No. P339B990480).
- One of the leaders in this project and lead author of this article is one of the most prolific writers in the area of distance education and disability (Kinash et al., 2004).

3.1. Background

The UW Distance Learning program was established in 1912. In 1995, the first UW Distance Learning course was offered online. By the year 2000, all UW Distance Learning courses had been converted to Internet-based courses. The UW Distance Learning program now offers more than 300 courses serving more than 10,000 students each year. The program uses a course delivery system that was developed mostly internally with assistance from the central UW computing services organization,

Computing & Communications. UW Distance Learning courses use tools for discussions, assignment submission, and peer review that were developed by the Educational Technology Group. The Educational Technology Group works closely with Computing & Communications in developing electronic tools, strategies, and training for faculty members and has a long history of working closely with the University's Access Technology Lab, which falls within the management structure of Computing & Communications. The Educational Technology Group, therefore, has always included accessibility considerations in product design and implementation, assuring that the Educational Technology Group tools used by the UW Distance Learning program have been for the most part accessible to students and instructors with disabilities.

Course content is delivered via *MyUWCourse*, an interface developed by Computing & Communications. Students log into *MyUW* with their network identification code; if they are enrolled in a distance learning course, they see a link to it on their *MyUW* course page. This link leads to a syllabus page with links to key course elements—lessons, assignments, and relevant Educational Technology Group activity pages. The course design is simple and straightforward, with few layers and links to follow to access the content.

3.2. Accessibility of UW distance learning courses

The first UW Distance Learning course offered on the Internet was *Adaptive Computer Technology*, taught by Drs. Norm Coombs and Sheryl Burgstahler in 1995. Since Dr. Coombs is blind, care was taken by the instructors and Distance Learning designers to assure that all course content was available in accessible formats; this included printed materials, video presentations, and Web pages. Student assignments and exams were submitted via electronic mail (Burgstahler, 1997).

Before the accessibility efforts the authors discuss in this article were undertaken, the distance learning program included policy and procedure statements on its Web site regarding the provision of reasonable accommodations for students with disabilities and a link to contact information for the campus unit that provides accommodations. (See <http://www.outreach.washington.edu/ol/handbook/resources.asp#disability>.)

The UW Distance Learning program became aware of the fact that many of its courses were not fully accessible to potential students with disabilities because of the inaccessible design of some content and communication methods. In response they developed procedures to assure that course Web pages are accessible; that instructors incorporate content that is accessible and consider accessibility challenges when they use telephone conferencing and other communication methods; that students are provided a vehicle for reporting accessibility barriers, and that design/development staff are trained in creating accessible course Web pages. The Distance Learning program undertook a collaborative project with the staff of the Access Technology Lab and project DO-IT to develop policies, guidelines, and procedures to assure that its courses are accessible to all potential students. The goal of the UW Distance Learning accessibility efforts is to develop guidelines and procedures that would ultimately improve the overall accessibility of the courses, thus maximizing program access and minimizing the need for special accommodations. DO-IT is a UW project funded through federal, state, and corporate funds to promote the accessibility of electronic and information technology nationwide in its efforts to maximize the academic and career success of individuals with disabilities. The accessibility efforts of the reported project benefited from and were built on existing technology access projects and programs on campus.

3.3. *Benchmarks and accessibility*

In the following sections, the authors of this article present ongoing efforts of the UW Distance Learning program, organized by benchmark areas identified by the Institute for Higher Education Policy as essential to the success of an Internet-based distance learning program at any institution.

3.3.1. *Institutional support*

Institutional Support Benchmarks reported by the Institute for Higher Education Policy promote the use of a technology plan to ensure both quality standards and integrity and validity of information and a centralized system that provides support for building and maintaining the distance education infrastructure. UW Distance Learning administrators put a priority on handling accessibility issues in a way that is consistent with campus infrastructure, guidelines, and support systems.

The careful review of UW policies and consultation with the University's ADA compliance officer assured project participants of the UW's commitment to nondiscrimination and reasonable accommodations and to, specifically, meeting its obligations under Section 504 and the ADA. Although the University is exploring the possibility of developing a specific policy regarding the accessibility of electronic and information technology, at the time of this project it applied current policies and procedures for meeting Section 504 and ADA obligations in the technology area. Computing & Communications, with the assistance of DO-IT and ATL staff, developed a Web site devoted to guidelines and resources for making Web pages accessible (see <http://www.washington.edu/computing/accessible/>), first pointing to Section 508 standards to use as campus guidelines and then to the more in-depth guidelines and resources provided by W3C. This is the primary resource page for those involved in assuring the accessibility of distance learning courses at the University.

3.3.2. *Course development*

Course Development Benchmarks reported by the Institute for Higher Education Policy suggest that guidelines regarding minimum standards be used for course development, design, and delivery, and instructional materials be reviewed periodically to ensure they meet program standards. The UW Distance Learning program adopted the accessibility guidelines promoted on the campus Web site; focusing on assurance that Section 508 standards are met. The Distance Learning staff created accessible Web page templates and cascading style sheets (CSS) that are used for all courses to assure compliance. They developed skills and procedures in working with course content experts and instructors to assure that course components are accessible.

DO-IT staff, as part the National Center for Accessible Information Technology in Education (AccessIT) and the Alliance for Access to Science, Technology, Engineering, and Mathematics (AccessSTEM), delivered training to the distance learning course developers. Follow-up and ongoing technical support was provided by the Access Technology Lab. Access Technology Lab staff continues to work with the Educational Technology Group to promote accessible tools and course materials that are used by the UW Distance Learning program. Access Technology Lab staff also continues to deliver stand-alone accessibility presentations and promote the integration of accessibility content into mainstream Web and other technology classes campus-wide. The Web accessibility campus Web site is prominently linked from key campus Web pages. An "accessibleweb" discussion list was established for those interested in this topic, and meetings of the group are held monthly. Key members of the UW Distance Learning design team participate.

Some of the specific technical efforts included developing a CSS-based course page template. This standardizes and simplifies the formatting of each page; because it is built in, it takes the design staff less time and effort to create accessible pages. The use of CSS-based formatting simplifies navigation, making it accessible to screen readers and easy to navigate using a keyboard alone. The design includes skip-navigation links for site visitors using text-only browsers or screen readers, text alternatives for graphics images, and page elements like tables that are designed to be accessible.

3.3.3. *Teaching/Learning*

Teaching/Learning Benchmarks promote student interaction between faculty and other students as an essential characteristic of online learning courses and that this interaction can be facilitated through a variety of ways including voice communication and electronic mail. The UW Distance Learning program developed training materials regarding instructional issues instructors need to be aware of using communication methods accessible by all students in a class.

3.3.4. *Course structure*

Course Structure Benchmarks reported by the Institute for Higher Education Policy include that students should be advised about the nature of and technical requirements of a program before starting an online course, be provided with supplemental information for a specific course, and have access to sufficient library resources, including a “virtual library” accessible through the World Wide Web. In the case of UW Distance Learning, students are provided with information about basic technical requirements (access to the Web via a minimum 56K connection, Internet Explorer 5.0 and above or Netscape 6.0 and above); along with any specific requirements depending on their course (some specialized software is required for programming and engineering courses). For students with disabilities, this means that students who require assistive technology will provide that on their own computers, unless they happen to be using campus computers. There, the assistive technology is provided by the University within the Access Technology Lab or other facility. These policies are consistent with those for students without disabilities. Distance learning instructors are encouraged to use accessible Web sites.

3.3.5. *Student support*

Student Support Benchmarks suggest that students should receive appropriate information about courses and programs as well as student support services and access to technical assistance. Before the accessibility project that the authors discuss in this article was undertaken, the UW Distance Learning program included statements on its Web site regarding the University’s commitment to nondiscrimination and the provision of reasonable accommodations for students with disabilities and a link to contact information for making accommodation requests. The program did not, however, include a statement about a commitment to the design of accessible courses for students or a policy statement and guidelines for faculty and course designers. Thus, it promoted the notion that accessibility was something to be addressed only by providing accommodations for a specific student once enrolled in course. As a result of the accessibility project, a new statement regarding a commitment to accessible design was added to the student information. The statement reads: “We strive to make our online courses accessible to everyone. We specifically consider design features that make our courses accessible to individuals with disabilities, including those using assistive

technology for computer access.” A link to technical support staff assigned to deal with access barriers is also provided. Student reports of accessibility barriers serve to help guide design staff in these efforts and ultimately result in courses that are more accessible to future students with disabilities.

Remaining unchanged is the original statement that tells students where to direct requests for reasonable accommodations with a link to information about the office that provides such services. Together, these two statements make it clear that the program is committed to designing courses that are accessible to all students but understands that some students with disabilities may still require accommodations.

3.3.6. Faculty support

Faculty Support Benchmarks reported by the Institute for Higher Education Policy require that technical assistance in course development is available to faculty members, that faculty members are assisted in the development of their courses, and that ongoing support is provided. The UW distance learning program information pages for faculty tell how to refer students with disabilities in need of accommodations to the campus unit that provides this service to students with disabilities and encourage them to use accessible Web sites in their courses. They also state the program commitment to accessible design. Instructors teach from materials that have already been designed with universal design principles applied by design staff. Distance learning design staff consult with instructors who want to add elements to the courses they teach, assuring that additional materials meet accessibility guidelines. Building in accessibility during the design of a course assures full access to course materials for prospective instructors with disabilities. This way, new instructors do not need to be familiar with the practices of universal design.

3.3.7. Evaluation and assessment

Evaluation and Assessment Benchmarks reported by the Institute for Higher Education Policy require that a program’s educational effectiveness and teaching/learning process is assessed through an evaluation process that uses several methods and applies specific standards. The UW Distance Learning team conducts a four-staged quality assurance review, which includes standards on accessibility. Through this process the materials are vetted and revised to make sure that finished products meet department standards.

4. Future plans

During the course of this project, ideas for several extensions of accessibility efforts emerged. One is to assure that the distance learning course development tools are accessible to potential staff with disabilities (e.g., people who are blind). Another is to review the content of courses and assure that access issues are included in content as appropriate. For example, accessibility issues are discussed in a current introductory Web development course and accessible design is required in the final project. In addition, accessibility content is included in courses and certificate programs with curricula on Web and instructional design. Project staff would like to identify other technology courses that should include accessibility content and, if at this point this content is not included, encourage instructors to add this content to their courses. Finally, the distance learning team is developing new support systems for staff,

faculty, and students in distance learning. These pages will include additional information on accessibility issues and practices for course instructors and participants. DO-IT facilitates similar support nationwide through its AccessDL Web site and discussion list (see <http://www.washington.edu/doi/Resources/accessdl.html>).

4.1. Lessons learned

The efforts reported in this paper show that creating accessible distance learning courses is an ongoing effort, not a one-time project. Challenges encountered in the process include ambiguity in how the Section 508 standards should be implemented, getting such a diverse and large community as the UW to work together and consistently, gaining faculty and staff buy-in, and overcoming technical problems such as presenting streaming media, coding math characters, and dealing with PDF files. The experiences of the University of Washington suggest that distance learning programs that wish to assure that their courses are accessible to all students and instructors obtain buy-in and support from the administration, include key stakeholders—including students with disabilities—in the decision-making process. They should also address the following issues:

- **Policy.** Review existing campus policies regarding program and information access to individuals with disabilities and, specifically, accessible technology. Although having a policy at the highest possible level may be desirable, a general policy that assures a commitment to comply with Section 504 of the Vocational Rehabilitation Act and the Americans with Disabilities Act is adequate for developing statements and procedures regarding distance learning program access. Be sure that policies and procedures address both universal design considerations and disability-related accommodations.
- **Guidelines/standards.** Decide on guidelines or standards (e.g., Section 508 standards, W3C guidelines, institutionally designed standards) to be used to evaluate the accessibility of courses and guide program designers and instructors.
- **Procedures.** Incorporate accessibility guidelines into the existing course development guidelines given to course designers, content experts, and instructors.
- **Dissemination.** Be sure that policy and procedural statements are included prominently in information given to students, faculty, and distance learning course developers.
- **Training.** Make sure that accessibility training is available to distance learning program staff and instructors.
- **Support.** Assure that technical staff and online resources are readily available to support distance learning program staff and instructors.
- **Enforcement/reward.** Routinely check courses to assure that accessibility guidelines/standards are applied, and consider giving rewards to individuals/teams that make exceptional efforts towards accessibility of courses and incorporation of accessibility topics in the content of courses.
- **Evaluation/revision.** Periodically review courses for accessibility, and revise guidelines/standards and procedures as appropriate. Include individuals with disabilities in the review and improvement process.

UW Distance Learning program staff found that applying accessible design strategies often resulted in cleaner, better functioning pages that were easier to use by all students and instructors. They have learned that applying universal design principles benefits people without disabilities as well as those with disabilities.

5. Future research

Much work remains to be done before all distance learning courses are fully accessible to students and instructors who have disabilities. Research that addresses the following questions would contribute to reaching this goal.

- What specific benchmarks are critical to any online learning program that is accessible to students, faculty, and staff with disabilities?
- What specific policies and practices nationwide have been effective in the delivery of online learning program that is accessible to students, faculty, and staff with disabilities?
- How can the accessibility of an online course be evaluated?
- What tools are currently available to help online learning designers make their courses accessible; what additional tools are needed?

6. Conclusion

Distance education options create learning opportunities for everyone if accessibility considerations are made in the design process. Otherwise, they can impose needless barriers to equal participation in academics and careers for potential students and instructors with disabilities. Employing universal design principles as Internet-based distance learning courses are created can bring us closer to making learning accessible to anyone anywhere at any time. It is important to develop a campus-wide commitment to accessibility and an acceptance of this as an ongoing effort. Remember, a “learning organization is a group of people pursuing common purposes (individual purposes as well) with a collective commitment to regularly weighing the value of those purposes, modifying them when that makes sense, and continually developing more effective and efficient ways of accomplishing those purposes” (Leithwood, Jantzi, & Steinbach, 1995). Distance learning professional organizations can take a leadership role in promoting the development of accessible courses by all programs.

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