The Missing Piece: The Need for Training
Online Faculty to Design Accessible Online Courses

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Consider the following scenario. As a dedicated faculty member in a public university, you have worked diligently to prepare your courses for a new term. In this regard and to afford your students every opportunity to be successful in your courses, you include an online learning product as part of your curriculum. This platform is available to students 24 hours per day and serves as a tutorial and the opportunity for immediate feedback to students on the accuracy of their answers. Furthermore, this venue is used for the administration of tests. The semester begins and your students are both prepared for class and enthusiastic about the subject matter. You have every reason to believe that the term is progressing well, when one day after class, a blind student raises concerns about the inaccessibility of the technology; instead of investigating the matter, you advise him to contact the vendor. He does as directed, but still is unable to access the online materials. Again, he brings the problem to your attention and you recommend that he seek the assistance of another student in the class. The situation persists for nearly one month before the student contacts the university’s Office of Disability Services, to no avail. Because the student finds that he is far behind in the course, he withdraws and files a complaint with the U.S. Department of Justice on the basis that the university failed to provide access to the online portion of the class, a necessary component for his academic success.

Unfortunately, the above facts are real and resulted in a settlement agreement by Louisiana Tech University and the Board of Supervisors for the University of Louisiana System with the U.S. Department of Justice. The student was enrolled at the university and was awarded nearly $24,000 to remedy alleged violations of the Americans with Disabilities Act (ADA). Furthermore, the agreement required Louisiana Tech to “adopt a number of disability-related policies, including the requirement to deploy learning technology, web pages, and course content that is accessible in accordance with the Web Content Accessibility Guidelines (WCAG) 2.0 Level AA standard in the university setting” (U.S. Department of Justice, 2013, n.p.). Additionally, the university had to make existing web pages and instructional materials constructed since 2010 accessible. The agreement, also, mandated yearly ADA training for all teachers and administrators as well as for all incoming students.

This is just one of several cases that involve technology, higher education institutions and students with disabilities. In 1996, a student who was blind filed suit against California State University’s for failure to provide blind and low vision students access to computer labs and accessible testing. Similarly, students with hearing impairments filed suit against the University of California at Berkeley and Davis campuses for not accommodating students with hearing impairments. In 2010, Pennsylvania State University found itself in a case that accused them of not providing access to websites and course management systems (Wenz, Jaeger, and Lazar, 2011).

The purpose of this article is to create an awareness of the need for web accessibility for students with disabilities and to stress the importance for university administrators to develop and implement web accessibility training for their faculty and staff. Several suggestions are included which are meant to provide guidance in how to create a viable web accessibility training program for higher education faculty.

Students with Disabilities in the Higher Education Setting

The world’s largest minority, people living with a disability, was defined by the United Nations as an estimated 10 percent (or 650 million people) of the population (United Nations Web Services, 2006). People with disabilities are less likely to use Internet-based communications technologies: 65 percent of Americans have broadband at home, but only 42 percent of Americans with disabilities have these services. This gap is due in part to physical barriers that people with disabilities confront in using the Internet” (FCC, 2014, n.p.).

In colleges and universities today, there are almost 11 percent of students who are reported to have some type of disability (National Center for Education Statistics, 2012). Schools offer students opportunities to receive appropriate accommodations through their respective disability services offices. Only 40 percent of students with disabilities have contacted their postsecondary disability services offices about needing accommodations (Wagner, Newman, Cameto, Garza, and Levine, 2005). Unfortunately, about two-thirds of students receive no accommodations in post-secondary education because their schools are unaware of their need. Students with disabilities may receive accommodations and instruction that are not appropriate with their learning needs and/or are inconsistent with the content and rigor of the course curriculum (Boone and Higgins, 2007; Sapp, 2009). Faculty may not be aware of the characteristics of disabilities and how to properly adjust their instruction to meet the needs of their students (Leyser, Vogel, Wyland and Brulie, 1998; Reed, Lund-Lucas, and O’Rourke, 2003). In addition, many faculty members are not aware of how to implement proper accommodations in their classrooms for students with disabilities (McGuire, Scott, and Shaw, 2003; Ouellett, 2004). Many students with disabilities report negative perceptions and attitudes from faculty members when requesting accommodations. These perceptions and attitudes impact their desire and motivation to complete their college degree (Beilke and Yssel, 1999). Lombardi and Murray (2011) suggest that universities should focus on providing professional development opportunities for designing effective instructional strategies and implementing accommodations for students with disabilities. Therefore, higher education institutions should provide professional development opportunities for faculty in order to increase web accessibility for students with disabilities.

Empowerment and Access:
Higher Education for Persons with Disabilities
Web Accessibility and Disability

Just as there are barriers in the physical environment, there are barriers in the world of technology. The major categories of disabilities that are affected by inaccessible web content are: visual, hearing, motor, and cognitive. The latter may include developmental disabilities such as autism spectrum disorder and learning disabilities that would include dyslexia, dyscalculia, dysgraphia, or attention deficit disorder (Bohman and Anderson, 2011; Friere, Petrie, and Power, 2011). Olalere and Lazar (2011) found that 92 percent of government websites were inaccessible while Rubai-Barrett and Wise (2008) found that 63 percent of state government websites were inaccessible. Furthermore, Flowers, Bray, and Algozzine (2000) reported that many institutions of higher education had inaccessible web sites. These inaccessible websites may include online courses created by faculty.

The history of web accessibility is a grim story. Before the federal government stepped in with legislation, users with disabilities all too often had to struggle with accessibility problems such as garbled content for a user using a screenreader, garish visual effects for a user that would be subject to seizures due to wild colors or flashing effects, or other aspects of web design lacking attention to the web accessibility guidelines. In the words of Wentz, Jaeger, and Lazar (2011), “The failure to address issues of accessibility for persons with physical, sensory, and cognitive disabilities ultimately threatens people with disabilities as the permanent second-class citizens of the information age” (Already at a Disadvantage, para. 6). Furthermore, the failure to address these issues with web accessibility will impact the opportunities to participate in education, employment, and society for people with disabilities.

Web accessibility is defined as the quality of web design that ensures that all users can access the content of a given website. The design of web content should be fundamentally designed to work for everyone regardless of disability (Rello, Kanvinde, and Yates, 2011). But if the web content is not developed in an accessible manner, then technology or assistive technology cannot help make it accessible and unnecessary barriers are created (Calloway and Meraj, 2004). For online course content to be accessible, Burgstahler (2006) suggested two approaches. First, the web designer should provide alternative methods for accessing inaccessible features or formats provided. Next, faculty should be careful to avoid inaccessible data and features in their online courses.

In order to ensure access for all, the World Wide Web Consortium (W3C) developed four principles that provide the foundation for web accessibility: perceivable, operable, understandable, and robust (W3C, 2008). The principle of perceivability makes the web content available to the senses, primarily visual and auditory through the browser or assistive technologies (e.g., screen readers, screen enlargers, etc.). The principle of operability allows users to interact with controls and interactive elements using the mouse, keyboard, or other assistive technology device. The third principle, understandable, ensures that web content is clear and not confusing or ambiguous. Finally, the fourth principle of robustness makes sure that a wide range of technologies can access the web content.

Inaccessible course content can, also, present barriers to the communication of web content. One example of inaccessible web content is a document with no consistent heading structure will result in confusion to the user. Screen readers can misinterpret content due to lack of structure and good design. Another example is creating content with various colors making the content inaccessible to the reader with color blindness. Multimedia, such as video, that does not contain captions or transcripts can be considered inaccessible as well. In addition to web-authoring tools that promote accessibility (such as Dreamweaver), the user who creates original content to be uploaded to a web page must create with accessibility in mind. Application creators, including Microsoft and Adobe, have addressed accessibility, developing options for creating accessible documents.

In one complaint made by a student encountering barriers to learning due to web inaccessibility, the student claimed that the class assignments, chat, discussion board functions, and course documents were inaccessible on the LMS, Moodle. The student, also, claimed that videos did not provide captions, the library database material and course registration were inaccessible as well. If the course was web accessible, then the student would have been able to use a screen reader to translate into text the reading assignments uploaded. He would have had access to an audio program that would have read him the text and he would have the opportunity to complete his assignments for the course. Instead, professors, or their assistants, dropped the ball on uploading the information properly to the LMS, which caused the inaccessibility of the materials (Szpaller, 2012).

When web content is created with accessibility in mind, attention is placed on such issues as maintaining consistency and organization in presentation and not using colors for conveying information, clearly labeling and describing tables and images, and providing captions and transcripts for multimedia. This, also, means removing barriers in the web content, such as providing an image that has alternative text available or the arrangement of content so that keyboard access is straightforward. Additionally, with accessible web content, the user can adjust colors and fonts and adapt the document to their own abilities.
Web Accessibility and Students with Disability in Higher Education

The importance of web accessibility for students with disabilities in higher education is increasingly vital based on the upsurge of the popularity and availability of online courses. Ortagus and Stedrak (2013) found:

Between fall 2002 and fall 2010, student enrollment in online courses nearly quadrupled from approximately 1.6 million to 6.1 million in degree-granting postsecondary institutions in the U.S. Over the same time period, the percentage of college and university students who took at least one online course more than tripled, from 9.6 percent to 31.3 percent. By 2011, nearly three-quarters (74.5 percent) of all four-year institutions reported an increase in the demand for online courses and programs (p. 30).

Online education is an integral and viable vehicle for postsecondary education and, accordingly, college and university providers must understand not only their legal obligation to accommodate qualified students with disabilities, but the necessity of training faculty in instructional design to create accessible online courses. The resources of many online courses may include interactive web pages, electronic books, discussion boards, and web-based courseware packages (Schmetzke, 2001). However, Calloway and Meraj (2004) reported in their study that members in higher education at one university expressed a lack of awareness about web accessibility. When the study’s participants were asked about why there was a lack of awareness, they stated that they had never thought of web accessibility. One wonders if this is the case across the nation. Research is regrettably scant on the lack of awareness of faculty surrounding web accessibility.

Applicable Laws and Legal Considerations

Federal laws prohibit public institutions from discriminating against students with disabilities as illustrated in the above scenario, including Title II of the Americans with Disabilities Act of 1990 (ADA), as amended by the ADA Amendments Act of 2008, Section 504 of the Rehabilitation Act of 1973 (Section 504) and Section 508 of the Workforce Rehabilitation Act (Section 508). Furthermore, these laws protect qualified individuals with disabilities, which are defined as persons with a physical or mental impairment that substantially limits one or more major life activity or individuals who have a history of or who are regarded as having such a physical or mental impairment. Major life activities may include caring for one’s self, walking, seeing, hearing, speaking, breathing, working, performing manual tasks, and learning. Moreover, once an individual qualifies as an individual with a disability, in order to receive services, education or training, he must meet normal and essential eligibility requirements with or without reasonable accommodation. In the educational context, this involves a student meeting all criteria to be admitted into the higher education institution as well as any specific program or activity with or without reasonable accommodation. A reasonable accommodation is generally considered to be whatever action is necessary to accommodate the disability without causing an undue hardship on the entity (U.S. Department of Health and Human Services, 2006). In a university setting, some reasonable accommodations and modifications that can be made to the requirements of courses or programs can include affording extra time to complete tests, reducing course loads, special seating, note takers, and early registration.

The ADA provides, in part, that “no qualified individual with a disability shall, by reason of such disability, be excluded from participation in, or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity” (42 U.S.C. A. §12132). Similar in substance, Section 504 states, in pertinent part, that “No otherwise qualified individual with a disability in the United States, as defined in section 705(20) of this title, shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance or under any program or activity conducted by any executive agency or by the United States Postal Service” (29 U.S.C. § 794).

Section 508 and the Twenty-First Century Communications and Video Accessibility Act of 2010 (CVAA) established the direction of accessibility legislation. Continuing efforts by other governments and companies are contributing to meeting the challenges of providing access to information technology to all users. The United Nations Convention on the Rights of Persons with Disabilities (CRPD), in its efforts to identify and eliminate “obstacles and barriers to accessibility... applied its measures to...information, communications and other services, including electronic services and emergency services” (United Nations Web Services Section, 2006, Article 9, Accessibility, n.p.).

The guidelines that resulted from Section 508 required that the web sites of federal agencies be accessible, but entities that do not fall under Section 508 are discovering that the intent of the law to promote accessibility of information technology does affect them. Together with the ADA and Section 508, the CVAA provides “groundbreaking protections to enable people with disabilities to access ... [emerging 21st century technologies including] ... broadband, digital and mobile innovations” (FCC, 2014, n.p.).

Equally important is the obligation of recipients of federal funds and public agencies to provide equal access for qualified individuals with disabilities to public facilities, programs, services, benefits and opportunities. Accessibility not only concerns physical considerations but, additionally, online presence in courses and other technology. The legal parameters of the latter
Best Practices for A Web Accessibility Training Program

Computer users with disabilities may encounter various barriers when attempting to access an online course. These barriers can be prevented by implementing a proactive, rather than a reactive, approach to creating online materials by all concerned, including faculty, administrators and students. Not only is web accessibility important because it fulfills the purpose of supporting learning, but, also, increased accessibility improves independence and efficiency in the lives of users with disabilities (Gerber, 2003).

Many programs for web developers provide the means for ensuring that a website is accessible. Moreover, many resources to assist with web accessibility are available online at no cost. In the case of faculty using learning management systems (LMS), such as Blackboard, these programs provide tools to address accessibility concerns. When teaching faculty how to use these tools to improve web accessibility, consideration should, also, be given to the non-LMS programs that are primarily utilized by faculty and students. The cost of accessibility, when carefully planned and designed, is almost zero (Slatin, 2001), especially if the training for web accessibility is begun at the development stage of course design (Cal Poly, 2014). Burgstahler, Corrigan, and Carter (2005) suggested that checklists should be developed in order to identify guidelines and standards for web accessibility. These checklists should be based on guidelines from law (Section 508), campus policy, and the World Wide Web Consortium. Basing checklists on these guidelines and standards provides consistency with other universities across the nation. Utilizing these checklists, additionally, help faculty ensure that their online courses are web accessible. Several universities (e.g., University of Washington, Texas A&M, University of Arkansas at Little Rock, and Cal Poly) have created such checklists.

Once guidelines have been established, an assessment should be conducted for each online course. The assessment should include a web accessibility review for the course web page, subject content review, instructional content review, and a final technical review (Burgstahler, Corrigan, and Carter, 2005). Assessment of an online course can provide the faculty member valuable information as to the areas of the course that need improvement and which sections of the course may be inaccessible to students with disabilities.

Creating a Web Accessibility Training Program

Faculty members are aware that they are not trained in making course content web accessible (Calloway and Meraj, 2004). Estimates show 75 to 90 percent of higher education classes have an online component. The barriers to access to online materials have been shown to cause a discrepancy in graduation rates between students with disabilities (33 percent) and students without disabilities (48 percent)(National Center for Educational Statistics, 2012).

As with all valiant efforts, the drive to instruct faculty on the hows and whys of creating accessible web content must start simply. One of the first steps would be the vision and support of the administration. Owens (1991) believes that one of the most critical leadership activities of educational administrators is to share a vision and communicate it with stakeholders. A desirable faculty development program should start with the university having a vision of what motivates faculty and staff to buy into that vision. Additionally, any plan developed for improving web accessibility should include funds for training faculty and staff in the formal budget.

One of the next steps should be to conduct a needs assessment for web accessibility as well as an evaluation of the accessibility of online courses offered. This important step will help the university determine the strengths and weaknesses of the existing online course programs (Green, 2009). The identification of needs and objectives from the needs assessment will help determine subject content for the training program (Kirkpatrick, 2009). This information can be collected from faculty members, students, campus technology staff, and other involved stakeholders. Moreover, the needs analysis will help identify deficiencies in the online course program to be targeted for improvement.

After conducting a needs assessment, the next step should be to implement a web accessibility model designed to meet the needs of a broad range of stakeholders. One possible framework that can be used in this regard at the postsecondary level is built upon the concept of Universal Design for Learning (UDL). In 1985, Mace developed the notion of Universal Design (UD) with the thought that “one size does not fit all.” UD involves creating and designing environments, products, and buildings with a broad range of users in mind. UD considers the needs of a diverse population by presenting options, alternatives, and adaptations to eliminate barriers in the environment and provide access to that environment (Rose, Harbour, Johnston, Daley, and Abarbennell, 2006). UDL grew out of Mace’s original idea.

The framework of UDL is built upon the following three principles: multiple means of representation supported by the sensory network of the brain, multiple means of expressing supported by the strategic network of the brain, and multiple means of engagement supported by the motivational network of the brain.
Campus instructional technology departments, faculty, students, and administrators can utilize the results of the needs assessment to develop and offer professional development workshops as well as one-on-one and workshop consultation to faculty and staff in the construction of educational materials and courses that will be web accessible (Lewis et al., 2007). This training should provide participants with hands-on training and opportunities to create accessible online courses. Faculty members should approach the training from the perspective of a student with multiple disabilities to see if the course is web accessible. One example of such a tool is offered at the University of Texas at Austin, which provides support through its Accessibility Institute. This resource was created after evaluating instructional web sites on campus and identifying accessibility concerns (Lewis et al., 2007).

After the training program has been budgeted, developed, and taught, an evaluation is necessary to determine the effectiveness of the training program. According to Kirkpatrick (2009), goals of the evaluation process of the web accessibility training program should include gaining information on how to improve training and determining whether the training should be continued.

**UDL: Reducing Barriers to Learning**

**Conclusion**

Valid web accessibility training programs encompass the following similarities: support of top-level administration, a thorough analysis of needs and evaluation of courses, a framework to support the web accessibility model in place, and training personnel across the entire campus in web accessibility for online courses. In addition, higher education institutions must include sufficient funds annually to accomplish this goal as well as incentives for compliance with efforts to promote web accessibility awareness. And, as with all successful programs, ongoing evaluation is a necessity.

Web accessibility is required by law. Faculty members must be made aware of the need for web accessibility for students with disabilities. Due to the increase of online courses, accessibility to these courses is important for the success of students with disabilities in the post secondary setting. Recognizing the impact of accessible technology on the success of these students, faculty should plan and develop web accessible courses and materials to increase independence and further success for these students. Federal guidelines and laws require nothing less. In order for this to occur, effective professional development in web accessibility training for faculty must be a priority and postsecondary institutions have an obligation to provide training in this regard to all applicable employees.

**References**


*Figure 1*. Examples of best practices from various checklists for creating web-accessible online courses.

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<thead>
<tr>
<th>Best Practices for Web Accessibility</th>
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<tbody>
<tr>
<td>1. Create a formal institutional statement regarding web accessibility.</td>
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<tr>
<td>2. Use multiple methods of content delivery (UDL)</td>
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<tr>
<td>3. Develop course content first, then course design</td>
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<td>4. Provide simple, consistent navigation</td>
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<td>5. Include an accommodation statement</td>
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<td>6. Use multiple and varied instructional strategies to reach multiple and diverse learning styles</td>
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<td>7. Ensure that all online content comply with accessibility guidelines and standards</td>
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<td>8. Label charts and graphics with alternate text</td>
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<td>9. Add text within text boxes to allow software readers to read the text instead of incorporating the text boxes a graphic</td>
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<td>10. Transcribe audio (such as lectures) into a text format</td>
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<td>11. Transcribe videos and include captions</td>
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<tr>
<td>12. Use appropriate color combinations for visual aids, such as graphics, are clearly described to minimize color blindness effects</td>
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</tbody>
</table>
13. Avoid the use of bullet points so that electronic reads can read the text easier
14. Choose fonts carefully
15. Give additional time on tests and quizzes using the tools in the LMS
16. Provide faculty with various templates for word-processing and presentations that are accessible by students
17. Provide course syllabi in accessible format
18. Send materials to the Office of Student Disabilities to be processed in time for students to access them
19. Provide a link to the Office of Student Disabilities so that students may make a request for reasonable accommodations
20. Collaborate with the university library to provide accessible auxiliary materials

(Burgstahler, Corrigan, and Carter (2005), Cal Poly, 2014; University of Arkansas at Little Rock, n.d.)