

Implementing Accessibility Standards in the Campus Technology Plan

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ABSTRACT

Recent legislation regarding the assurance of accessible electronic and information technology has prompted the United States Department of Education to develop specific directives that ensure the federal standards are upheld. Although the federal mandate has not yet been formalized to require compliance by universities and colleges, higher education administrators need to be proactive and establish guidelines that emulate the current accessibility standards. All academic institutions should develop campus technology plans that address the technical specifications and requirements of Section 508 and the recently passed Instructional Materials Act of 2002. Accessibility standards must be adopted for distributed learning programs, Web-based academic and student support services, and all matters related to the instructional uses of electronic and information technology. Funding and training programs for such directives must be provided to ensure the feasibility of implementation. This paper will outline a process by which administrators can modify or develop their existing technology plans to integrate accessibility in a cost effective manner. Resources and information will be given for reference.

Introduction

On December 21, 2000, the Architectural and Transportation Barriers Compliance Board, also known as the Access Board, issued the final accessibility standards for electronic and information technology under Section 508 of the 1973 Rehabilitation Act. Section 508 “requires that when Federal agencies develop, procure, maintain, or use electronic and information technology, Federal employees with disabilities have equal access to use of information and data” [1]. More recently, the 2002 Instructional Materials Act has mandated that “printed instructional materials used by blind or other persons with print disabilities in elementary or secondary schools [should be created] in the form of electronic files suitable for conversion into a variety of specialized formats.” By April 2004, all states receiving financial assistance under the Individuals with Disabilities Act (20 U.S.C. 1400 et seq.) will be required to develop statewide plans to ensure enactment of this law. [2]

Given this recent legislation, the U.S. Department of Education published a guide entitled: Requirements for Accessible Electronic and Information Technology Design and began revising all of its federal procurement policies and directives to incorporate the standards [2a]. One of the most significant changes implemented by the department involved a decision to amend the Assistive Technology Act (29 U.S.C. 3011) to require compliance of Section 508 for states and sub-recipients of grants related to this program. This decision is significant because it establishes a precedent for other federal grant programs that fund technology-related initiatives. In turn, higher education institutions that receive federal funding for technology related projects or distance education will

now have to adhere to the technical specifications and requirements as outlined by Section 508.

Furthermore, since the Department of Education 's Office of Civil Rights (OCR) has always been involved with ensuring that compliance is met in accordance with all ADA regulations, the OCR has upheld several decisions making universities accountable for providing equitable access to Web-based information and distributed learning. In several states, students and faculty have been successful in their complaints regarding inequitable access in the use of technology-related resources, Web-based materials, and computer services. For this reason alone, administrators responsible for implementing their campus technology plan should take the time to review and revise its objectives to ensure compliance with the law. Inevitably, universities and colleges will indeed be expected to develop comprehensive policies within their strategic plans to address the integration of accessibility standards in the use of electronic and information technologies at their institutions.

Step One: Getting Organized

Unfortunately, most university educators are unaware of their institution's technology plan. Some technology plans consist of a few paragraphs in the overall campus strategic plan and even worse, some institutions do not even have a plan. Whatever the scenario, it is best to begin by organizing a committee of individuals willing to draft, revise, and ensure that the technology plan they create will be implemented. This committee should consist of a diverse group of faculty, staff, and students and include representatives from academic and student support services. It is pertinent that a representative from the campus office of disability services be on this committee. In many situations, the staff from the office of disability services is often excluded in the planning of campus-wide technology directives.

To gain a sense of what work needs to be done to revise the existing technology plan, the following materials should be reviewed:

1. The existing campus technology plan and/or the campus strategic plan
2. The overall budget for technology-related initiatives, academic and student support services, and other related areas such as computer and disability services
3. An assessment of existing technologies on campus (hardware, software, Web-based services, distributed learning materials and equipment)
4. An assessment of existing services and technologies available for students, faculty, and staff with disabilities or special needs of accommodation

Knowing this information will allow the committee to determine what monies and resources are available to improve the implementation of accessibility standards on the campus. Knowing what adaptive and assistive technologies may already exist on the campus and how the office of disability services responds to requests for accommodation is also important to determine what additional resources may be needed to ensure greater access for electronic and information technology.

Step Two: Determining Priorities for Accessibility

Establishing priorities of what to revise or do regarding the implementation of accessibility standards will at first be very challenging. The best way to approach this challenge is to determine what can be done that provides the best level of accessibility within the available budget. The objective is work within the framework of available resources first before drafting a proposal requesting additional monies. It is highly unlikely that monies will be available for technology needs, particularly in the area of assistive and adaptive technologies because most institutions fail to consider these items in general budget planning. The technology plan should address this issue of securing funding and insist upon a specific budget targeted for accessibility projects.

The three most basic areas of accessibility related to technology include: Web-based services and documents, computer labs and public workstations, and instructional technology, with specific focus on distributed learning practices. In addition to these areas, it is also important to determine specific objectives for training, resource assistance, and assessment. All too often, technology plans are created with little, if any, discussion of training, funding, and final evaluation.

Web-based Services

The campus Web site is by far the most crucial element in terms of accessibility for all of its users. A recent survey of 10,000 high school students revealed a university's Web site is the third most important source of information for prospective students, subordinate only to a campus visit and a conversation with a current student [3]. More and more academic and student services are being transferred to the Web. Students are told to register online, use the virtual library resources, and retrieve assignments from faculty course sites. The assumption that people can gain easy access to Web-based documents is a great misconception. Most people do not own the state of the art equipment and software and may have to rely upon different browsers or slower modems to download information. Others do not have the applications to download media rich graphics or PDF files. Some people do not even own a computer. And for a student with disabilities, the barriers can be even greater. What happens when these pages are not accessible? And who addresses the problem? The campus technology plan should outline a detailed strategy to ensure that the primary Web site of the institution is accessible.

The reasons for making Web documents more accessible are endless. First of all, there has been an increase in the enrollment of students with disabilities. Secondly, thanks to distributed learning, a more diverse and technical oriented student population is emerging on and off our campuses. Finally, it's much more cost effective and adds to the marketability of an institution. In a study on "How the Internet is Improving the Lives of Americans with Disabilities," it was found that people with disabilities spend an average twice as much time online as people without disabilities. The study also noted that young people with disabilities (under age 30) spend 25 hours a week online in comparison to their non-disabled peers who spend only eight hours a week. [4]. Campus Web sites that

are riddled with accessibility problems will prevent prospective students from accessing information. Is this the first impression a campus wants to make?

Even though most educators agree that Web accessibility is important, many administrators are still very reluctant to modify their existing Web sites because they believe the revisions will prove too time-consuming and too costly. Some institutions make use of alternative text-only sites to accommodate disabled users, but this practice is just as problematic. Although this method seems to be an easy and practical way of accommodating such users, in most cases it proves that the text-only alternative site may not be equitable to the actual site. Slatin (1998) claims “it is virtually impossible not to think of the media –rich variant as the “real” and the therefore privileged site” In his view, when it comes to text-only substitutes, “separate is not and cannot be equal”[5]. One primary reason is that text-only pages are not often updated to coincide with the changes made of the primary page. Information on these pages may be inaccurate and dated. In comparison, it would be like using a different edition of a book for a class. Although most of the information may be the same, the differences that exist may be significant. As a result, equal access to information does not exist.

The best method to implement web accessibility into the technology plan is to include a directive that requires all campus Web documents to adhere to the Web Content Accessibility Guidelines created by the Web Accessibility Initiative [6]. These guidelines serve as the model for the requirements listed for section 508’s Web-based Intranet and Internet Information and Applications (1194.2). Administrators should provide a summary of these requirements directly in the technology plan and offer specific action steps to assist Web designers with the application of these standards. Although it may be a challenge to mandate campus-wide standards for the development of Web accessible documents, administrators should require that all pages meet basic requirements in accessibility before they are posted or linked to the campus Web site. In many cases, universities and colleges already have specific guidelines in place on what materials can be linked to the primary campus Web site so amending the policy to include the use of universal design practices should not pose any real conflicts.

Instructors who insist that they cannot comply to such a mandate because they are using higher end technologies should at the very least provide an alternative format to their Web pages. Any video or audio used in streaming PowerPoint, applications such as Flash, or other animations must have synchronized captioning with the visuals. All visuals and audio must be captioned. Web-based captioning can be done using a number of tools such as SMIL, MAGPie, or the more advanced features of QuickTime. Lucent technologies, for example has developed the Bell Labs Text-to-Speech system (TTS), which has various applications including reading electronic mail messages and generating spoken prompts in voice response systems. Visually-impaired students or those with reading disabilities can cut and paste web material into a text box located at the Bell lab web site and use a variety of voices to read the information.[7]

For those instructors who include multimedia in their Web-based documents, accommodation may seem rather challenging. However, there are several tools designed

to make multi-media more accessible. For example, WinScripter v1.0 is a “unique program that contains image editing, 3-D rendering and WYSIWYG ("What You See Is What You Get") HTML/DHTML/CSS/ Javascript editing capabilities all combined into one convenient and easy-to-use package.” Instructors who want to include the use of graphics in their Web sites can make use of the ‘ALT’ tag generator found at the WinScripter site to describe images up to 500 characters. There are numerous online resources describing ways to make Web sites more accessible and many research facilities such as the DO-IT Center at the University of Washington and the Trace Center at the University of Wisconsin that provide assistance, shareware, and information regarding Web site accessibility.

To further encourage the practice of adhering to universal design principles in the creation of Web documents, institutions could emulate the University of Arizona’s project to promote accessibility. When the University of Arizona decided to implement accessibility standards into practice, the group responsible for updating the campus developed a system by which existing pages would be validated for accessibility errors and then repaired accordingly. Campus pages that adhered to the guidelines were given a University of Arizona Accessibility logo to validate the page. This logo in turn served as an incentive for other people to create and modify their existing pages for compliance within the university guidelines. UA also created a Web Accessibility Help Page that included samples of pages with accessibility errors and provided before and after examples of actual university pages to serve as a guide. This project did not involve extensive costs and effectively brought the campus into a “culture of access.” [8]

Computer Labs

The second major area the technology plan should address in terms of accessibility involves the access to public computer workstations in computer labs, the library, and other computing workspaces on campus. Berliss (2000) recommends that since “10% of the general population is disabled, a reasonable goal would be to have about 10% of computer equipment and resources marked for accessibility”. [9] Unfortunately, most universities and colleges fail to meet this level. In many situations, people may not even know where they can locate an accessible workstation. Likewise, very few libraries, especially those at smaller or regional campuses possess accessible equipment for their patrons. Hence, it is important for the technology plan to outline provisions for accessible workstations on campus.

The guidelines for what constitutes an accessible workstation can be found in Section 508’s standards for Software Applications and Operating Systems. The basic requirement for software applications and operating systems is that the product possesses built-in features of accessibility or be compatible with existing assistive technology. Alternate approaches are allowed as long as the alternate provision offers equivalent or greater access than the actual approach. This specific standard outlines in detail, the requirements for several functions needed to facilitate accessibility. The first function involves the use of the keyboard to execute functions. If an individual is unable to use a mouse or pointing device to execute commands, keyboard access to a program’s controls

is important. In fact according to the standard, “all actions that can be identified or labeled with text are required to be executable from a keyboard.” For web-assisted, specifically computer mediated instruction, students may have to use the mouse to execute commands to move forward in the program or to complete specific tasks. Instructors using these formats should determine if students could actually execute commands from a keyboard by navigating the Web document using only keyboard commands.

The next function for accessibility of software and operating systems relates to the disruption of activated accessibility features that are built into a product. Accessibility features include the ability to reverse the color scheme, showing visual prompts, or providing “sticky-keys” that, allows users to press combinations of keys sequentially. Sometimes, these features are disrupted when the new software program overrides the input or output devices of any existing program. Although this issue may be a concern of the technical support staff, it is important that instructors be aware of the ways in which various software programs interact with one another when loaded together. Students required to use software packages in a web-based course need to be given information on how to ensure the downloading of this software will not disrupt the application program interface of their computer.

Another issue involving the interface of the computer deals with the input focus of the screen. According to the requirement, the” focus should be programmatically exposed so that the assistive technology can track focus and focus changes.” The focus on a computer screen refers to the area that is highlighted for an action to take place. If a user clicks on the mouse or hits the enter key, an action will occur on the focus area. For example, if a paragraph of text was highlighted and then the “delete” key was typed, the action would remove the highlighted text from the document.

The technology plan should outline provisions to provide at least one accessible workstation in each of the public access computer labs, the campus library, and if funding allows, the creation of a mobile unit to be used for instructional purposes. If monies are not readily available to make these accommodations, future proposals need to address this request. Administrators need to realize that the purchase of an accessible workstation is not limited for use. Anyone can use the workstation.

Distributed Learning

As distance education programs continue to expand their course offerings, monies for distributed learning are often targeted for comprehensive portal systems or elaborate courseware packages. Although many courseware vendors claim that they are working on improving their levels of accessibility, the fact remains: not one of the existing courseware platforms available on the market today offers complete accessibility. In fact, in a study conducted by the Academic Technology Resource center at the University of Toronto, it was found that the courseware packages WebCT and BlackBoard (two of the most common packages used in Ohio) ranked the poorest for meeting the accessibility guidelines for courseware products [10].

Since many institutions use courseware products to teach Web-based, computer-mediated courses, and even hybrid courses, it is important that provisions are established to accommodate students with disabilities who may enroll in these courses. Instructors need to ensure that disabled students are provided with a similar learning environment to that of their non-disabled classmates. One method to ensure consistency in this practice is to develop an orientation program for instructors preparing to teach in the distance education program. In addition to providing these individuals with instruction on how to use the distance education technologies, instruction on accessibility guidelines for distributed learning can also be included.

Furthermore, it is more proactive to purchase distributed learning technologies that have higher levels of accessibility. Requiring distance education departments to purchase accessible products at the outset will eliminate the need for expensive retrofitting at a later time. In most situations, planning for the purchase of distance education equipment does not involve discussion of the equipment's accessibility. In fact, cost and technical effectiveness is perhaps the primary concerns of these purchases. The technology plan can outline specific requirements for the purchase of software and hardware to be used in the distributed learning program and also any other instructional program. Administrators involved in the purchase of such equipment should verify the level of accessibility in these items. If the item is not accessible or cannot work with existing adaptive technologies then it should not be purchased.

In addition to Web-based and computer-mediated instruction, there are accessibility standards for videoconferencing. The 508 standards that apply directly to videoconferencing equipment are found in Sub-Part: Video and Multimedia Products (1194.24) and include the following technical specifications:

1. All analog television displays 13 inches and larger, and computer equipment that includes analog television receiver or display circuitry, shall be equipped with caption decoder circuitry which appropriately receives, decodes, and displays closed captions from broadcast, cable, videotape, and DVD signals.
2. Television tuners, including tuner cards for use in computers, shall be equipped with secondary audio program and playback circuitry.
3. All training and information video and multimedia productions regardless of format, that contain speech or other audio information necessary for the comprehension of the content, shall be open or closed captioned. Likewise, material that contains visual information necessary for the comprehension of the content shall be audio described.
4. Display or presentation of alternate text presentation or audio descriptions shall be user-selectable unless permanent.

If we apply these provisions to distance education, then it is recommended that all course materials: lecture notes, handouts, assignments, tests, and multimedia materials be made available to each remote site at least one month prior to the start of the first day of class. These materials can then be modified into alternative formats for students with

disabilities that might enroll in the course. It is also very useful for the remote sites to have copies of the course materials in case the course does not transmit to the site as a result of technical problems. Students then can access the course materials that were distributed to the other sites.

Instructors who do intend to use visuals should adhere to specific design guidelines. Hricko (2001) suggest the following considerations:

1. All television screens are wider than they are high by a ratio of 4 to 3. Visuals should be created in the same manner to coincide with the aspect ratio of the screen.
2. Slides should be created in a landscape orientation to optimize the use of space on the screen. This set-up is better for viewing graphics such as diagrams and other images on the screen.
3. A 10% border should be left around the entire visual to create an “essential area” for which to work. This set-up will ensure that the entire visual is seen at the remote sites.
4. Avoid visuals with complicated details. Present text and information in smaller units (additional slides) so users will have time to process what they are reading. Too much information on a given slide may be difficult for students with learning disabilities to process, particularly if the slide sequencing is fast.
5. Limit the number of words on a page or slide to seven per line and five lines per page. This amount of text is a reasonable level for most readers to process.
6. Text should be written in 24-30 point size and in a font that has normal spaces. Do not use scripted fonts, but more universal fonts such as Ariel. Make certain that the case of the text is consistent. Avoid all capital letters. Using different texts within a slideshow can be confusing. [11]

All visuals should be described in both audio and text formats and be made available upon requests. It is advisable that this preparation be included as part of the development of content for the course. In this way the materials will not have to be made during the delivery of the course and will be readily available not only for students with disabilities, but for any student that may need additional review of the course material.

In addition to the ensuring accessible course materials, distance education administrators should evaluate the physical layout of the videoconferencing room and its components to ensure it is ADA compliant. Most videoconferencing labs are not furnished with set-ups that can accommodate adaptive technology. The physical facilities of a lab should be dynamic to allow flexibility for accommodations to be made.

Some videoconferencing labs set the instructor’s workstation apart from the student seats by placing it up on a platform. The instructor then stands or sits on a raised chair to adjust the controls for the equipment. Set-ups such as these are not accessible to students and faculty in wheelchairs. It is also important to ensure that the controls are easy to access, particularly by individuals who may have motor-disabilities. Set-ups for student seating are usually accessible, but the equipment that students use to transmit responses

to the instructor or classmates at the remote site may not be compliant. Some may require students to use voice-activated systems that direct the video camera to zoom in on the speaker. Individuals that have speech impairments may have difficulty in getting the system to pick up their voice. Other videoconferencing units require students to press and hold down a microphone control to activate the camera's attention to them, and then the student speaks to the remote site. This set-up can be problematic for students with motor-control disabilities. In addition "microphones shall be capable of being turned on and off to allow the user to intermix speech with TTY use.

All videoconferencing rooms should be equipped with at least one TDD line because "interactive voice response telecommunication systems shall be usable by TTY users." (194.23). Additional outlets for adaptive technology equipment should also be included in an accessible area. Software and hardware that the institution plans to use to make accommodations should be evaluated for compatibility with the videoconferencing system. Adaptive technology should be "network-able" to prevent technical problems during the transmission of the course. It is also important to check that "interference to hearing technologies (including hearing aids, cochlear implants, and assistive listening devices) shall be reduced to the lowest possible level" (194.23). Individuals responsible for the sound design of the room should ensure that this issue is addressed to improve the overall sound quality of the videoconference.

Finding Resources

The technology plan should establish a campus accessibility council to be responsible for keeping abreast of the latest information regarding accessibility initiatives. This group can also coordinate resource development and training for the campus. There are numerous agencies that provide free or low cost resources for training and development in the area of disability services. Do-IT provides several free training materials and low cost video programs for faculty and student development. These materials include handouts, guidebooks, and bibliographies on disability related topics.

Online resources are endless, but there are several useful sites that are very comprehensive. The most extensive site that provides information on Web Accessibility Tools is the W3C's "Evaluation, Repair and Transformation Tools for Web Content Accessibility." This site lists a wide variety of tools to validate, repair and build accessible Web documents. Specific tools are available to make courseware elements, graphics and applications such as PowerPoint more accessible. All of the tools are user friendly and require minimal technical knowledge to download and use. The user is usually directed on which guideline is not met and how to repair the inaccessible element. If one does not have time to make changes on a Web site, there are even tools available to do the work [12]

In addition to tools, there are numerous checklist sites to use when evaluating accessibility on campus. Checklist documents such as *The Unofficial Section 508 Web Accessibility Checklist* (http://access.idyllmtn.com/section508/table_plain.html) and WebAim's *Section 508 Accessibility Checklist*

(<http://www.webaim.org/standards/508/checklist>) are available to assist in the process of such assessment. In addition, the Access Board and other organizations related to providing disability services offer a wide range of support for resources and materials to be used in instruction. It is not difficult to build up a resource center of materials for educators and students to use. These materials can be housed in the campus library or office of disability services for reference. The technology plan should address the development of a resource center or a Web site that can provide assistance in applying accessibility standards.

Training Programs

In order to ensure that the campus community has an understanding of Web accessibility standards, it is necessary to create a program in which people can participate in training. This training can involve a series of simple workshops to a much more comprehensive certification program in which people receive training in the use of adaptive and assistive technologies. All faculty involved in teaching in the distance education program should receive training in the use of adaptive and assistive technologies so they can better understand how to work with students who may need to use these devices. Training need not be extensive, but rather generalized to provide needed information to resolve problems that may arise in using this equipment.

Training programs can also involve instruction on universal design principles for creating Web accessible documents. Such instruction will benefit instructors not participating in distributed learning, but involved in the creation of Web materials for their traditional courses. The technology plan should include action steps to ensure that training does take place for all of the stakeholders. It is important to provide training opportunities for the support staff as well who will most likely be responsible for working with the new technologies. Just because computer services staff works with technology does not mean that they know how to use assistive or adaptive technologies. It is important for administrators to recognize the value of allowing technical and support staff to upgrade their skills in this area.

Funding the Mandate in Higher Education

Administrators responsible for distance education initiatives at their institution must include funding for assistive and adaptive technology in the budget planning to ensure that monies are available to meet the needs of students and faculty with disabilities. More importantly, it is highly recommended that individuals responsible for the purchase of new technology model the Federal guidelines to procure products which best comply with the standards as outlined by Section 508. Monies should also be made available for training on the use of adaptive and assistive technology. All too often, distance education projects fail to address issues of training and development of the staff that will implement the technology.

A specific plan outlining ways in which monies will be secured directly and indirectly should at least be presented. Grants, partnerships, and potential methods of

securing financial assistance should be discussed and considered in the development of the plan.

Evaluation and Assessment

Finally, the technology plan should include specific objectives related to evaluation and assessment of how the accessibility standards have been implemented. All too often, when strategic plans are created, there is no follow-up or evaluation of the objectives and actions proposed by the plan until a report needing this information must be presented to a higher administrative office. Plans are usually written and then files away.

The technology plan should be seen as a dynamic document that is evaluated on a continuous basis to ensure that the objectives meet the existing needs of the campus community. Evaluation and assessment are key components and should relate to goals that the plan sets out to accomplish. The methods for evaluation vary, but the plan should at least include both qualitative and quantitative evaluations to generate information and data that can be used for a more thorough review. Having an assessment design in place will also prove useful for submitting application for grant monies. In many cases, specifically with technology grant programs, evaluation is a key requirement of the grant proposal.

Conclusion

Implementing accessibility standards in the campus technology plan will ensure greater access to electronic and information technologies on campus. It is important to realize that it is proactive to respond to the mandates of Section 508 and the Instructional Materials Act even though both laws have not yet been applied to higher education settings. Creating a culture of access on campus benefits the campus community in many ways.

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