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THE STATE OF WEBSITE ACCESSIBILITY IN HIGHER EDUCATION

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Abstract

Higher education has continued its trend toward attracting students of all ages, walks of life and abilities. With the popularity of online education increasing each year, students with physical disabilities find themselves in a position to acquire an education that may have previously been out of reach. Recent innovations in website design, however, have concentrated on visual appeal, with the extensive use of video, animation and other dynamic graphical effects. These techniques enrich the experience of the average user but can be frustrating to visually impaired web surfers unless careful design measures are employed. Additionally, the federal government, through Title II of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act has attempted to address website accessibility issues, with the U.S. Department of Education taking the lead with its Office of Civil Rights' investigation of the California Community College System. This paper will examine how well some colleges and universities' websites fare in terms of website access evaluation.

Keywords: Web accessibility, higher education, best practices for Web site evaluation

Introduction

Higher education has continued its trend toward attracting students of all ages, walks of life and abilities. With the popularity of online education increasing each year, students with physical disabilities find themselves able to acquire an education that may have previously been out of reach due to the difficulty of actually attending classes. While colleges and universities have long understood the measures they need to take in order to accommodate physically challenged students in the classroom, providing truly accessible websites is a relatively new problem.

Web accessibility, according to the W3C Web Accessibility Initiative, means "access to the Web by everyone, regardless of disability" (What is web accessibility, n.d.). For websites, accessibility ensures that disabled persons can "perceive, understand, navigate and interact" with the site. Recent innovations in website design, however, have concentrated more on visual appeal, with the extensive use of video, animation and other dynamic graphical effects. These techniques enrich the experience of the average user but can be frustrating to visually impaired web surfers unless careful design measures are employed. In a study commissioned by Microsoft, it is estimated that nearly 1 in 4 internet users are visually impaired (2003).

For higher education, providing a properly designed, accessible website is not just a matter of good practice, it is a requirement. According to the United States Department of Labor, Section 504 of the Rehabilitation Act of 1973 states that "no otherwise qualified individual with a disability in the United States [...], shall, solely by reason of his or her 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” (U.S. DOL, n.d.). Colleges and universities fall under the category of “program or activity” because of their receipt of federal funds. A non-accessible college or university website is a violation of Section 504, and leaves the institution vulnerable to legal ramifications. In 1990, the Americans with Disabilities Act extended the requirements of Section 504 of the Rehabilitation Act to all colleges and universities, not just those receiving federal funds.

The process of converting existing Web-based content or developing new content to a format suitable for users with disabilities is challenging. There is no one solution for addressing the multitude of accessibility issues. Different types of disabilities require the implementation of special solutions. The most promising result for institutions of higher education is to adopt a series of best practices and procedures for Web content evaluation. Such measures include conformance to the rules for accessible Web pages provided under Section 508, the World Wide Web Consortium’s (W3C) Web Content Accessibility Guidelines (WCAG), use of third-party software utilities designed to evaluate Web sites, use of the latest Web markup languages like the eXtensible Hypertext Markup Language (XHTML), and results based on solid human evaluation and testing.

Under Section 508 law enacted by Congress in 1999, federal agencies are required to develop Web sites accessible to people with vision and hearing impairments, with limited dexterity, and with other disabilities. The law mandates that people with disabilities be given comparable access to Web-accessible government information as others; the Act also pertains to organizations which receive funds from the federal government. According to the Information Technology Technical Assistance and Training Center (ITTATC) at the Georgia Institute of Technology (2006), while the Section 508 standards are available to anyone to incorporate in part or in whole, Section 504 does not require accommodations to be provided through conformance with Section 508 accessibility standards. Institutions of higher education may however choose to comply with Section 508 guidelines as a way of meeting 504 requirements.

The section 508 specifications include sixteen requirements for making Web sites accessible. While a majority of the specifications are pulled from the W3C’s Web Content Accessibility Guidelines, Section 508 includes additional guidelines that are more specific, require a higher level of site access, and are written in a more regulatory tone.

A second approach to creating accessible Web sites is provided under the World Wide Web Consortium’s (W3C) Web Content Accessibility Guidelines (WCAG). The W3C was established in 1994 for the purpose of developing and maintaining interoperable technologies that are designed to lead the World Wide Web to its full potential. In recent years, a major goal of the W3C has been the development of technologies and guidelines designed to make Web content more accessible to users with disabilities. The W3C announced its Web Content Accessibility Initiative in 1999 by publishing a series of Web accessibility guidelines also known by the title Web Content Accessibility Guidelines. The W3C explains that the WCAG guidelines are designed to enhance the Web experience for disabled users as well as other user agents such as limited devices like mobile phones (1999).

Another best practice method for creating Web pages that are accessible to a wide range of users is to use the latest markup languages. The most common mark-up language for developing web pages is the Hypertext Markup Language (HTML). HTML was introduced in the 1990s and has since been widely expanded and adopted by web developers. Despite its popularity, HTML lacks rules and standards which results in the development of documents that are not consist in appearance when viewed in different types of browsers or user agents. The W3C (2002) explains “the plethora of new elements has led to interoperability problems for documents across different platforms”. For this reason, HTML is not a good language for creating web pages for users with accessibility issues. To overcome the problems with HTML, the W3C introduced a new markup language in 2000 based on the eXtensible Markup Language (XML), a new language for use as a universal markup language and for creating future languages for special markup needs. The effort to reformulate HTML as an XML-based language led to the development of the eXtensible HyperText Markup Language (XHTML). According to the W3C, the XHTML markup language is a new step in the evolution of the Internet. By using XHTML, developers can enter the XML world with all of its benefits and be assured that their content will continue to be backward and future compatible (2002). By 2001, XHTML had evolved into version 1.1. Since XHTML inherits the strict standards imposed by XML, it is a markup language that can be used to created pages that are displayed consistently from browser to browser.

Often times the implementation of best practices including the Section 508 standards, W3C WAIG, and XHTML markup are not enough to fully address all accessibility issues. A W3C (2006) article on selecting Web accessibility

evaluation tools stresses “many accessibility checks require human judgment and must be evaluated manually using different techniques. Also, in some cases evaluation tools are prone to producing false or misleading results such as not identifying or signaling incorrect code. Web accessibility evaluation tools can not determine the accessibility of Web sites; they can only assist in doing so”. Ultimately technology cannot identify or resolve all possible problems. No single tool or guideline can replace human evaluation. In such cases, human judgment is the only possible method for creating a Web site that is accessible in all ways to all users. Human judgment involves careful observation by web developers to identify and resolve known issues. It also involves the participation of disabled users in the development and testing phases. Software tools such as WebXACT and guidelines should be considered as a means by which to aid solid human assessment.

With the scores of guidelines available for measuring Web site accessibility, it is often time-consuming and nearly impossible to manually determine the conformance level of a site. To assist with this process, various software applications have been developed that are designed to evaluate Web sites against accessibility standards and provide a report of the findings. One of the most common applications is WebXACT, developed by Watchfire Corporation. WebXACT is a Web based application that can scan single Web pages for accessibility issues and report the results immediately. According to Watchfire, the WebXACT Accessibility Report summarizes the accessibility issues on the page to help determine if that page can be accessed by individuals using assistive devices, such as screen readers, and facilitates compliance with the U.S. Government's Section 508 and the World Wide Web Consortium's Web Content Accessibility Guidelines (Wright, 2003).

Given the importance of Web site accessibility, the legal ramifications for institutions, and the number of methods for determining site compliance, a major premise of this paper was to ascertain the state of Web accessibility in higher education. Based on previous organizational literature, it would be expected that larger institutions would have web sites compliant with accessibility guidelines. In a meta-analysis on organizational size and innovation, Damanpour (1992) found a positive association between organizational size and innovation. Large organizations are believed to have more finances, better research capabilities, and better product development expertise since they tend to have more professional and skilled workers. However, in different industries, the amount of innovation of small vs. large organizations varies and may be related to the internal structures of the organization. Smaller organizations or large organizations with smaller internal structures may be more innovative because they are more flexible, have a higher ability to adapt and improve, and are more willing to accept change (Damanpour, 1992). The assumption behind the current study is that institutions with larger, more varied student populations and with greater access to financial and technical resources tend to address accessibility compliance more than smaller institutions.

Methodology

A random sample of 60 public institutions of higher education was compiled using the College Source online database. Each institution was grouped into one of six groups based on total student enrollment. Each enrollment group contained ten institutions. The institutional break-down by region is listed in Table 1:

Table 1. Region Distribution

U.S. Region	Number of Public Institutions
Southwest	9
West	11
Northeast	11
Midwest	13
Southeast	14
Alaska/Hawaii	2

The main web site or home page for each institution was compiled and tested for accessibility issues using Watchfire Corporation’s WebXACT service. WebXACT is a free online service that tests single pages of web content for accessibility issues. Specifically, the web-based application scans a Web site and determines if the page

meets the W3C's WCAG's Priority 1, Priority 2, and Priority 3 standards. It also reports on compliance with Section 508 standards. In addition, the accessibility utility provides the number of errors associated with a Web site. Due to page restrictions, a complete listing of the institutional survey data is not included here but is available upon request.

Results

To test whether larger institutions would demonstrate a higher level of compliance than smaller institutions, the data was analyzed with appropriate analysis of variance statistical techniques using SAS statistical software. There was no significant statistical relationship between the size of an institution and its level of compliance. A summary of the data is listed in Table 2.

Table 2. Summary of Findings

Summary of Compliance	Value
Percentage of institutions with P1 compliance	46.67%
Average number of P1 errors	0.73
Percentage of institutions with P2 compliance	3.33%
Average number of P2 errors	2.85
Percentage of institutions with P3 compliance	3.33%
Average number of P3 errors	2.60
Percentage of institutions with Section 508 compliance	18.33%

The W3C provides that priority 1 guidelines *must* be satisfied; otherwise, one or more groups will find it impossible to access information in the document. Furthermore, priority 2 guidelines *should* be satisfied; otherwise, one or more groups will find it difficult to access information in the document. Additionally, priority 3 guidelines *may* be satisfied; otherwise, one or more groups will find it somewhat difficult to access information in the document. The data summary shows that institutions are more likely to be compliant at the priority 1 level, but more than half support Web sites that make it impossible for disabled users to access information.

Conclusion

As suggested by the literature, there are a number of guidelines available to institutions of higher education to assist in the process of developing accessibility conformant Web sites. A goal of this research was to examine the accessibility status of Web pages for colleges and universities in the United States.

This paper hypothesized that institutions with larger student populations: i.e., those with access to greater financial and technical resources, are more likely to be compliant than smaller institutions. A major result of this exploratory study is that there was no significant difference between an institution's student population and Web site accessibility compliance. In addition, the majority of institutions surveyed failed to meet the minimal accessibility requirements outlined by Section 508 and the WCAG standards.

A quick search on some of the university websites that failed compliance across the board showed that online classes are regular offerings at these institutions, with some offering entire degrees online. These institutions, in particular, are leaving themselves vulnerable to legal ramifications under Section 504. Additionally, these universities are among the larger institutions surveyed, further supporting the point that institution size is not a factor in web compliance issues.

Why there is no difference between size and Web site accessibility compliance is worthy of further study. If larger and smaller organizations alike are not conforming to the standard, it does not appear that financial resources are a

cause for lack of compliance. It may be that educational institutions are unaware of the mandate or legal ramifications. Internal structures of educational institutions may not be in place for identifying and integrating technical changes required by law into the university setting. Another possibility is that there may be a lack of technical expertise in educational institutions that can bring the web sites into compliance.

In sum, these findings warrant further study to determine the causality. A more in-depth analysis of this topic would provide an understanding of why institutions do not meet minimal standards, and how non-compliance affects current and prospective students with disabilities.

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