Increasing Web Accessibility and Usability in Higher Education

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INTRODUCTION

Just as wheelchair ramps and elevators provide access to wheelchair users, good Web design provides "electronic curb ramps" to the Internet for individuals with visual or other disabilities (Waddell, 1997). Research shows it is easier and less expensive to initially construct accessible Web pages rather than to retrofit the pages with corrections. Most of the technical requirements for accessible Web design can be met if Web designers adhere to the straightforward principles suggested by the World Wide Web Consortium's Web Accessibility Initiative.

Accessible Web site design benefits all users, not just persons with disabilities. This is because users with slow Internet connections, users who access the Internet via personal Web devices and users who are speakers of foreign languages may also experience accessibility challenges (Rose & Meyer, 1996). In short, accessible Web sites increase usability. Accessibility, a component of usability, suggests "information systems flexible enough to accommodate the needs of the broadest range of users … regardless of age or disability" (Waddell, 1997). Usability is achieved by designing with the end user in mind, to ensure that a user has access to any Web site, no matter when or how the access is sought (Pearrow, 2000).

This chapter addresses the current status of Web accessibility and usability in higher education. Specifically, it includes (1) why accessibility and usability concepts are important; (2) who is affected; and (3) some basic strategies to design accessible Web sites.

CURRENT STATUS

Most universities offer application-to-graduation services via the World Wide Web. Students access the Internet to read course descriptions, register for classes, pay tuition, purchase books, submit assignments, take quizzes and check grades. Students appreciate this ability to perform such functions at any time and from any place.

Faculty members seek to enhance student learning via online PowerPoint lecture notes, graphics and Web site links; and both faculty and students routinely access printed, audio and visual resources from around the world. Many faculty members develop their own course Web sites or use course management software packages such as Blackboard or WebCT to supplement their resident courses. Just-in-time (JIT) classroom-based learning now coexists with anytime, anywhere Web-supported learning.

Many persons with disabilities (i.e., visual, auditory, physical and/or cognitive) have limited or no access to the Web. Though approximately 29% of Internet users with disabilities take courses over the Internet or use online resources for their schoolwork (Kaye, 2000), Web-based "schools" are not open to all. Cohn, Molinero and Stoehr (1999) analyzed the Web sites of 25 United States (US) major universities and 76 US pharmacy schools using the CAST Bobby 3.1.1 validation tool. Results showed that 76% of Web sites were *not* accessible. Two years later, Cohn and Wang (2001) examined 114 US sites of top universities with doctoral programs identified via

U.S. News and World Reports; 39% Web sites were not accessible.

Given the globalization of education, international Web site accessibility is also of interest. Cohn and Wang found that university Web sites are even less accessible in China. Only 8% of 62 Chinese university sites identified via the yahoo.com search engine were accessible.

The accessibility of "virtual campuses" is not just an issue of fairness or good business, but is addressed by legislation Section 508 of the Rehabilitation Act. Federally supported institutions now must comply with accessibility guidelines, and government Web sites must be accessible. The US Architectural and Transportation Barriers Compliance Board set forth requirements for federal Web sites under Section 508 of the Rehabilitation Act. Furthermore, Section 255 of the Telecommunications Act mandates universal access to computer networks (www.w3.org/wai/policy/#USA).

RATIONALE

The major categories of disability that can impede access to Internet-based information include vision, hearing, motor and cognitive impairments. Persons with disabilities sometimes use various assistive technologies to access computer information. Unfortunately, recent Internet trends and developments have surpassed the capabilities of the assistive technologies (e.g., audible screen readers), often leaving these individuals with insufficient access.

Common problems that create difficulties for people who rely upon assistive devices to obtain Web-based information include the improper use of image-based navigation, frames and multimedia. However, when properly structured, each of these elements can be employed in an accessible manner. It is a common misconception that an accessible page needs to be "text-only." In fact, even a "text-only" page can be inaccessible if it includes ASCII art. Conversely, a well-designed page displaying different multimedia and graphics can be completely accessible.

EFFECTIVE WEB DESIGN STRATEGIES

The World Wide Web Consortium's Web Accessibility Initiative (www.w3c.org/wai/) established guidelines for images, frames, tables, multimedia components, hypertext links, page orientation, Java scripts and applets, graphs and charts. This section on Web design describes some simple yet effective design practices.

Page Organization

A well-organized page promotes Web accessibility. Text should be clear and simple, and headings and lists should follow a consistent structure throughout the Web site. Navigation buttons should be placed in the same page location so the user can anticipate their position. Also, large buttons are easier for users to see and use.

Many Web designers use cascading style sheets (CSS) to control how elements are displayed within a Web page. The style sheets include style specifications for fonts, colors and spacing to Web documents. However, older browsers or assistive technologies cannot read all style sheet presentation features. Alternative Web pages should therefore be presented without CSS. This requires adding text equivalents for any image or text generated via style sheets.

The presence of style sheets can enable the user to suspend the movement of flashing text or graphics by simply turning off the style sheets. This is an important accessibility feature, because displays that flash or blink can cause epileptic seizures in susceptible individuals if the flash has a high intensity and is within the frequency range of 2 Hz to 55 Hz. Instructions on how to "turn off" the style sheets are usually present in the "Help Section" of the user's browser (www.webaim.org).

Images

Images can easily be defined or described to persons with visual disabilities by using the HTML-based