

# National Center on Accessible Information Technology in Education

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**National Center on Accessible Information Technology in Education (AccessIT)**

**Regional Disability and Business Technical Assistance Centers**

**National Institute on Disability and Rehabilitation Research**

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**AccessIT**

## Accessible Web Design

Students of all ages routinely use the Web to do research and to work collaboratively with other students, scientists and scholars. Educational institutions also use websites to disseminate information about school activities to prospective and current employees, parents and the community. Websites are often used as instructional tools in both distance learning programs and on campus classes.

Information disseminated via the Web offers great opportunities for people with disabilities, provided the information is accessible.

This brochure provides an overview of some of the accessibility issues that people with disabilities face while using the Web, as well as information about existing web accessibility standards and guidelines.

Evaluating a website comprehensively for accessibility is a complex process that relies on both manual and automated procedures, and on the seasoned judgment of the evaluator. Teaching this process in its entirety is beyond the scope of this brochure, but tips are provided for checking a website for major accessibility problems, as well as links to useful online articles that can be used to increase awareness of typical problems and solutions.



## Who Benefits from Accessible Web Design?

Users who benefit from accessible web design include people with disabilities such as:

- blindness
- low vision
- color deficit or distortions
- deafness
- hearing loss
- impairments of intelligence, memory, or thinking
- the inability to interpret and/or formulate language symbol
- learning disabilities
- speech impairments
- paralysis, weakness, and other problems with movement and coordination of limbs
- photo sensitive epilepsy
- and combinations thereof

*Source: Web Content Accessibility Guidelines Version 2.0*

However, as is often true with accessible technology, many groups of users without disabilities will also benefit from accessible web design. More and more people are accessing the Web using technologies such as cell phones, handheld display units, or in-car computers. Accessible web design works more effectively for these users as well.

For more information, see the AccessIT Knowledge Base article: *How does accessible web design benefit all users?*

<http://www.washington.edu/accessit/articles?197>

## Common Barriers

The following common web techniques create barriers for some people with disabilities when they try to access the Web. Accessible web design can help to remove these barriers.

**Color:** Sometimes color alone is used to convey information on webpages. For example, a group of items might be color-coded to indicate a particular status or condition. If this information isn't available in some other way, such as by additional symbols or distinctions, then individuals who rely on screen reading technologies or who are color-blind will be unable to access it.

**Images:** When crucial content is presented only graphically, these images can present challenges for people who are blind or have low vision. Images that convey important information must also include alternative text to describe the image contents. (In order to compose useful alternative text,



imagine describing the site to someone over the telephone.) Images used for spatial placement or for visual appeal, but that do not otherwise add to the information presented on the page, should contain a null alt attribute (i.e., alt="") allowing screen readers to purposely skip them.

**Motion:** It is important to avoid any effects that move, blink or flash. Users with photosensitive epilepsy may be triggered into seizure by objects that are blinking at rates between 2 Hz and 55 Hz.

**Frames:** With the advent of the first graphical browsers, framesets allowed web authors to divide a webpage into multiple, independent regions. Inaccessibility was an early argument against this practice, along with server-side inefficiencies (multiple files required to load a single page), and cross-browser incompatibility. While these arguments have weakened with the evolution of browsers and web

servers, the fundamental flaw is that framesets cannot be effectively bookmarked and retrieved later, as there is never a single URL describing a given combination of frames. For this reason alone, the web design community has largely discouraged the use of frames. If frames are implemented on a site, authors should ensure that the titles provide useful descriptions of the frame content. For example, top, left, and middle do not adequately convey frame contents to a screen reader. A better choice of frame titles would be heading, navigation, and contents.

**Tables:** Tables can be problematic because they sometimes may be used to present information in a nonlinear fashion. Unless they are created carefully, they can be extremely difficult to interpret by a user accessing them with a screen reader. If tables actually contain data, they must be marked with the proper HTML code. This allows the screen reader to accurately associate all cells with the column and row headers that apply to them. It is also important to ensure that tables read clearly when they are read linearly (row by row across columns, as they are read with a screen reader).

**Forms:** Forms can be difficult for screen reader users to complete if form fields are not explicitly associated with the text labels that represent them. All form labels should be identified using the HTML <label> element. Also, keyboard shortcuts for the submit button and other form fields (defined in HTML using the accesskey attribute) are useful as they allow for easy navigation through a form without requiring the use of a mouse.

For more information, see the AccessIT Knowledge Base article: *How can I develop accessible web-based forms?*

<http://www.washington.edu/accessit/articles?159>

**Client-Side Scripting:** Client-side scripting, as with JavaScript, can be extremely powerful for navigation, dynamic content, forms validation, and a multitude of other enhancements. Unfortunately, many users disable scripting, and certain browsers or devices may not support it at all. The accessibility of scripting is further hampered by the fact that many effects, such as "fly-out" menus or images that change upon a mouse rollover event, are strictly mouse-dependent and otherwise inaccessible via the keyboard. As a general rule, client-side scripting should be used in moderation to enhance a webpage that is otherwise fully functional. All client-side scripts must be able to degrade gracefully, and alternatives to the scripted content should be provided.

For more information, see the AccessIT Knowledge Base article: *How do scripting languages affect accessibility?*

<http://www.washington.edu/accessit/articles?25>

**Multimedia:** The use of multimedia can create barriers for people with disabilities as content is provided both graphically and audibly, and each method depends on the other for a complete presentation. At a minimum, all multimedia must be captioned with synchronized text. If possible, multimedia should also be audio described. Multimedia should be playable via an accessible player.

For more information, see the AccessIT Knowledge Base article: *How do I make multimedia accessible?*  
<http://www.washington.edu/accessit/articles?70>

## Guidelines and Standards for Web Accessibility

Currently, there are two major sets of standards and guidelines for web accessibility: Section 508 of the Rehabilitation Act, and the Web Content Accessibility Guidelines (WCAG) developed by The World Wide Web Consortium (W3C).

The 1998 amendments to Section 508 of the Rehabilitation Act mandate that only accessible information technology can be acquired and used by the federal government. These amendments also establish accessibility standards for websites. These standards must be met when federal departments and agencies procure, develop, use, maintain or upgrade electronic and information technology.

For the federal government, the difficult-to-answer question of "Is this website accessible?" is replaced by the question: "Does this website meet Section 508 standards?" A website that meets Section 508 standards is considered accessible for the purposes of the federal government. However, this level of accessibility may not be the right goal for other entities. Schools, in particular, may want to set a higher standard of accessibility in order to better serve all students, faculty, and members of the general public.

The Web Content Accessibility Guidelines (WCAG) developed by The World Wide Web Consortium (W3C) might be better suited for educational institutions. The WC3 is an organization that was created to develop the specifications, guidelines, software, and tools that promote the continued development of the Web. One outcome of the W3C's work is the development of technical web accessibility guidelines. These guidelines include checkpoints for compliance and coding examples. To learn more, check out the Web Content Accessibility Guidelines 2.0 online (<http://www.w3.org/TR/WCAG20/>). It is a good idea to follow the World Wide Web Consortium Accessibility Initiative guidelines. However, doing so is voluntary.

For more information, see the AccessIT Knowledge Base article: *What is the difference between the W3C Guidelines and the Section 508 standards for web accessibility?*  
<http://www.washington.edu/accessit/articles?18>

## Conclusion

Educational entities need to promote development of web environments that maximize accessibility and usability. It's particularly important to educate web developers and those who procure technology so that they understand the consequences of inaccessible web design. Successful and effective web content developers try to serve all visitors, regardless of specific browsers, devices, or connection speeds. Easy to follow, consistent structure and clean, uncluttered design are the hallmarks of good design. They are also the building blocks of accessible websites. And, as one might expect, it is always easier to design a site for accessibility the first time, rather than going back to convert an inaccessible site into an accessible one.



### Additional Information on Accessible Web Design

- "Evaluation, Repair, and Transformation Tools for Web Content Accessibility" (Maintained by the World Wide Web Consortium)  
<http://www.w3.org/WAI/ER/existingtools.html>
- "References on Web Accessibility" (Maintained by the World Wide Web Consortium)  
<http://www.w3.org/WAI/References>
- "Designing More Usable Web Sites" (Maintained by the Trace Research and Development Center, University of Wisconsin)  
<http://trace.wisc.edu/world/web/>



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## Other Useful Knowledge Base Articles

- How do I make websites accessible?  
<http://www.washington.edu/accessit/articles?241>
- How can educational entities determine if their websites are accessible?  
<http://www.washington.edu/accessit/articles?71>
- How can I test my website for accessibility?  
<http://www.washington.edu/accessit/articles?87>
- What web accessibility evaluation and repair tools are available?  
<http://www.washington.edu/accessit/articles?148>
- How do I select a web accessibility software tool?  
<http://www.washington.edu/accessit/articles?244>

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