

## SOAP FOR WEB PAGES

**Table 1.** SOAP for Web Pages: Content Criteria for Accessible Web Page Design for Everyone.Everywhere

Category and Content Criteria
<b>Subject</b> What topics (critical product information, business operations, general information, training and education, career planning, job network, internet search) should be included to ensure that material is cohesive? What material will the communication cover? What are critical information needs for the multidimensional audiences? How can the material be sequenced for maximum usability?
<b>Occasion</b> When will the audience most often use the web pages (viewing, listening, reading, retrieving)? How fast will the audience need to access the information? Where will the audience access the communication? Will there be a need to customize the material for multidimensional audiences? What tasks will the audience perform as they use the web materials?
<b>Audience</b> Who is the primary audience (business websites, non-profit sites, informational sites, opinion sites, and ego sites)? How many audience levels will there be for the web materials (Occasional and Casual Surfers, Novice Surfers, Expert and Master (frequent) Surfers, Special Needs Surfers, and International Surfers)? What are the multidimensional audience levels? What level of experience does each level have? What job categories can be assigned to the audience? What type of subject knowledge does each audience level have? What role or level of decision-making authority can be assigned to the audience?
<b>Purpose</b> What is the goal or aim (to earn money, to provide information and/or opinions, to stroke egos, to create a professional image) of the site? What will be the scope for the web materials? What purpose for reading, listening, viewing, and retrieving can be assigned to the audience?

*Sources:* Adapted from textual material in Flanders & Willis, 1999; Hager & Scheiber, 1992; Kilian, 1996–2001; Lay et al., 2000; Lynch & Horton, 1999; Reece, 1993–1994.

## ACCESSIBLE DESIGN PRINCIPLES

**Table 2.** Principles for Accessible Web Pages

---

### Audio

Provide audio and text transcripts for video.

### Color

Maximize contrast between foreground and background elements.

Avoid busy backgrounds that may interfere with reading.

Avoid loud textures, patterns, or images.

Use portable colors for backgrounds.

Contrast dark colors from the extremes on the color wheel with very light mid-scale colors.

Avoid contrasting light colors from extreme locations on the color wheel against dark mid-scale colors.

Avoid use of achromatic colors (white, grey, black) that are similar in brightness.

Avoid contrasting low chromatic colors with those that are similar in brightness.

Avoid contrasting hues from adjacent parts of the color wheel, especially if the colors do not contrast sharply.

### Filtering (Lists)

Use ALT string to identify filter images such as bullets in lists.

### Filtering (Frames)

Provide meaningful NOFRAMES content plus appropriate links to other pages on the site. Omit frames whenever possible.

Avoid IFRAME until the technology becomes portable. Use browser-compatible specifications when creating frame borders.

### Images

Use the alternative text attribute (ALT text) of the image tag to provide a textual description of the image for people accessing the page in a non-graphical method (e.g., text only, speech, or Braille).

Use ALT text labels for image maps.

Use links for lengthy text descriptions of graphics.

Use ALT parameter to describe invisible graphics or language preferences.

Use descriptions of links when using a client-side image map.

List links as text when confined to use of server-side image maps.

Use empty string annotations for decorative graphics.

Use a nonscript alternative when using scripts.

Provide alternative text when using applets.

Provide semantic titles to horizontal rules.

---

---

## Input Forms

Avoid using image map “submit” buttons.  
Use text labels for all controls.  
Group and label related controls.  
Group and label menu controls.  
Consider using alternate page links with additional contact information.

## Interletter Spacing

Avoid close interletter spacing for people with central visual field defects.  
Use a wider spacing (e.g., monospaced fonts) than is provided in proportional fonts.

## Interword Spacing

Use a wider spacing (e.g., monospaced fonts) than is provided in proportional fonts.

## Leading

Use leading that is 25–30% of the point size.  
Add spacing between paragraphs.  
Apply more space between paragraphs than between lines.

## Links

Provide text versions of the links associated with image maps.  
Write link names so that they are self-explanatory.  
Avoid presenting links directly next to each other.  
Provide text-based links for graphics of text as links to facilitate browser changes for font size accommodations.  
Verify that the links that readers need on a page are visible without scrolling.

## Margins and Length of Line

Allow extra-wide binding margin for web materials intended for print.  
Permit 50–65 characters per line.  
Avoid leading reader’s eye off screen prematurely.  
Use generous space between columns.

## Paragraph Style

Indent first line of paragraph.  
Use hanging-indent style for paragraphs.

## PDF Files

Provide HTML or plain text versions.  
Make charts or graphs in the PDF file accessible.  
Provide URL for “Access Adobe” at the Adobe website.

## Shockwave, Scrolling Text, JavaScript, Plugins, etc.

Provide plain text HTML alternatives for material presented in formats other than plain HTML.  
Ensure that meaningful content is available for Flash movies to users who cannot access Flash.  
Use plain links to enable users to access subsequent pages of your site.

---

---

Ensure that JavaScript pages function correctly without scripts or provide parallel pages that do not use JavaScript.

Offer Flash and non-Flash versions of pages to ensure that users have control over how information is presented.

Avoid moving, blinking, and auto-refreshing text.

## Tables

Label table rows and columns.  
Summarize or repeat complex tabular information in alternative, non-tabular format.

Check that the tabular information is coherent when columns are removed.

Summarize or repeat complex tabular information in alternative, non-tabular format.

Check that the tabular information is coherent when columns are removed.

## User Interaction

Use auditory rather than visual browsers.

Avoid requiring users to click on small or moving targets to proceed to another page.

Check that the TAB order uses a coherent sequence for the content.

Use TABINDEX attribute for cases where the tab sequence needs revising for coherence.

## Video

Provide audio and text transcripts for video.

## Web Page Downloads

Allow a maximum of 20 seconds for download of web pages using a medium speed internet connection.

---

*Sources:* Adapted from textual material in Alschuler, 1998; Arditi, 1994; Flanders & Willis, 1999; Kilian, 1999–2001; Fontaine, 1995; Lynch & Horton, 1999; Lay et al., 2000; Nielsen, 2000; The Lighthouse, 1995; Text Matters, 2001; Reece, 1993–1994; Reece, 2001; Royal National Institute for the Blind, 1995–2001; Sullivan & Manning (1996-1998); Usable Web., 1999–2001.

*Note:* This chart excludes the principles given in Figures 1–2. More detailed principles and evaluation instruments are available upon request.

# USABILITY TESTING TECHNIQUES FOR ACCESSIBLE WEB PAGES

**Table 3.** Usability Testing Techniques for Accessible Web Pages

<b>Usability Testing Techniques for Accessible Web Pages</b>
<b>Requirements Analysis (Voice of the Customer)</b> Is the participant using the browser default values? Does the participant have physical limitations such as vision impairment, color blindness, and so on? What fonts reside on the participant's system?
<b>Navigation</b> Are the web pages written in <b>valid</b> HTML? Have the web pages been tested for accessibility? Have the web pages been tested for usability? Are the web pages understandable when tested using disengaged settings (mouse and graphics setting on the browser)? What navigation problem result when using disengaged settings? What navigation problems result when using a text-only browser?
<b>Content</b> Are the transcripts accurate?
<b>Contrast</b> Is there sufficient contrast for an easy-to-read document after converting the background image or color to a grayscale image using a graphics editor?
<b>Color Scheme</b> How effectively can the web page color scheme be overridden by the user's browser settings?
<b>Text Size</b> What are the results of pilot tests with users from the target population in text sizes: 10, 12, 14, 18, and 24 pt.? Do browser settings allow web visitors to make adjustments in text size for the pages that they view? Are relative font sizes being used in the HTML code?
<b>Complex Images</b> Is there a placeholder letter "d" next to complex images for cueing readers to detailed descriptions of images? Does the placeholder letter, "d," link to a page containing a detailed description of the image?

**Correctness**

Did the spell-checker find any errors?

**Direct Observation**

Have users of all abilities tested the web pages and provided feedback?

What new observations did you make about the usability of the web pages from the various groups of users?

*Sources:* Adapted from textual material in Flanders & Willis, 1998; Fontaine, 1995; Fuccella & Pizzolato (1999); Hamilton, 1997; Nielsen, 2000; Reece, 2001; and Royal National Institute for the Blind, 1995–2001.

## BIBLIOGRAPHY

- (1) Alschuler, L. (1998a). Rating your site, [web page]. zdnet.com. Available: <http://www.zdnet.com/filters/printerfriendly/0,6061,1600182-84,00.html> [2001, January 16].
- (2) Alschuler, L. (1998b). The W3C access checklist, [web page]. zdnet.com. Available: <http://www.zdnet.com/filters/printerfriendly/0,5051,1600184-84,00.html> [2001, January 16].
- (3) Arditi, A. (1996). Typography, print legibility, and low vision. In R. G. Cole & B. P. Rosenthal (Eds.), *Remediation and management of low vision* (1<sup>st</sup>. ed., Vol. 1, pp. 237–248). St. Louis, MO: Mosby.
- (4) Arditi, A., & Cagenello, R. (1992, January 26–28). A computer-based optotype acuity test system suitable for evaluation of acuity charts. Paper presented at the Noninvasive assessment of the visual system topical meeting, Santa Fe, New Mexico.
- (5) Arditi, A., & Knoblauch, K. (1994). Choosing effective display colors for the partially sighted. Paper presented at the Society for Information Display (SID) International Symposium, Los Angeles, CA.
- (6) Beckmann, P. J., & Legge, G. E. (1996). Psychophysics of reading—XIV. The page navigation problem in using magnifiers. *Vision Research*, 36(22), 3723–3733.
- (7) Bergman, E. (1994–1997). Towards accessible human-computer interaction (Version 1994–1997) [Internet]: Sun Microsystems Laboratories.
- (8) Boley, T. J. (1980). Course notes on subject, audience, occasion, and purpose (SOAP). Unpublished manuscript, University of Texas.
- (9) Burgstahler, S. (1999, October). Working together: People with disabilities and computer technology. Usability interface: *The newsletter of the STC Usability SIG*, 6, 1; 12–13.
- (10) Connell, B. R., Jones, M., Mace, R., Mueller, J., Mullick, A., Ostroff, E., Sanford, J., Steinfeld, E., Story, M., & Vanderheiden, G. (1995, April 1). The principles of universal design (1.1–2.0), [Web]. North Carolina State University, The Center for Universal Design. <http://www.design.ncsu.edu>: Available: [8120/cud/univ\\_design/princ\\_overview.htm](http://www.design.ncsu.edu/8120/cud/univ_design/princ_overview.htm) [1997, November 18].
- (11) Corn, A. L., & Koenig, A. J. (Eds.). (1996). *Foundations of low vision: Clinical and functional perspectives* (1<sup>st</sup>. ed.). (Vol. 1). New York, NY: AFB Press.
- (12) Cornog, D. Y., Rose, F. C., & Walkowicz, J. L. (1964). *Legibility of alphanumeric characters and other symbols: A permuted title index and bibliography* (A Permuted Title Index and Bibliography Library of Congress Catalog Number: 64–60082): The National Bureau of Standards.
- (13) DeBord Schulze, D. (1997). [Interview Notes, Research on text legibility for low vision: IEEE Professional Communication Society]. Unpublished raw data.
- (14) den Brinker, B. (1994). A new approach in designing low vision aids (LVA). In W. L. Zagler, G. Busby, & R. R. Wagner (Eds.), *Lecture notes in computer sciences*, 860, *computers for handicapped persons* (1st ed., Vol. 1, pp. 518–525).
- (15) Den Brinker, B. & Beek, P. (1996). Reading with magnifiers. *Ergonomics*, 39(10), 1231–1248.
- (16) den Brinker, B., & Bruggeman, H. (1996). Visual requirements for reading: The importance of a large field of view in reading with a magnifier. *Journal of Videology*, 1(1), 27–38.
- (17) DO-IT. (1997). [web page]. University of Washington. Available: <http://www.weber.u.washington.edu/~doit> [1997, December].
- (18) Dray, S. (2001, January/February). A narrative approach to user requirements for web design. *Interactions*, 8, 31–41.
- (19) Eperjesi, F., Fowler, C. W., & Kempster, A. J. (1995). Luminance and chromatic contrast effects on reading and object recognition in low vision: A review of the literature. *Ophthalmology Physiological Optics*, 15(6), 561–568.
- (20) Felker, D. B., Pickering, F., Charrow, V. R., Holland, V. M., & Redish, J. C. (1981). *Guidelines for document designers* (National Institute of Education 400–78–0043): American Institutes for Research.
- (21) Fine, E. M., Kirschen, M. P., & Peli, E. (1996). The necessary field of view to read with an optimal stand magnifier. *Journal of the American Optometry Association*, 67(7), 382–389.
- (22) Fine, E. M., & Peli, E. (1995). Enhancement of text for the visually impaired. *Optical Society of America*, 12(7), 1439–1447.
- (23) Fine, E. M., & Peli, E. (1996). Visually impaired observers require a larger window than normally sighted observers to read from a scroll display. *Journal of the American Optometric Association*, 67(7), 390–393.
- (24) Flanders, V., & Willis, M. (1998). *Web pages that suck: Learn good design by looking at bad design*. (1st ed.). (Vol. 1). San Francisco: Sybex.
- (25) Fontaine, P. (1995). Universal information access on the WWW (Version June 2) [Internet]. Washington, DC: General Services Administration.

- (26) Fuccella, J., & Pizzolato, J. (1999, June). Giving people what they want: How to involve users in site design, [Web]. IBM Corporation. Available: <http://www-106.ibm.com/sdeveloperworks/library/design-by-feedback/expectations.html> [2001, January 16].
- (27) Hager, P. J., & Scheiber, H. J. (1992). *Report writing for management decisions*. (1<sup>st</sup> ed.). (Vol. 1). New York: Macmillan Publishing Company.
- (28) Haley, A. (1999, January/February). Que pasa in type? *HOW?*, XIV, 64–69.
- (29) Hamilton, E. (1997, January 18). Writing accessible HTML (1<sup>st</sup> ed.), [web]. w3.one.net. Available: <http://w3.one.net/~hamilte/disab/accessible.html> [1997, February 18].
- (30) Hartley, J. (1987). Designing electronic text: The role of print-based research. *Educational Communications and Technology Journal*, 35(1), 3–17.
- (31) Hartley, J. (1994). Text design for the visually impaired: A British perspective. *Educational Technology*, 34(9), 58–64.
- (32) Hartley, J., & Burnhill, P. (1977). Understanding instructional text: typography, layout and design. In M. J. A. Howe (Ed.), *Adult learning: psychological research and applications* (1 ed., Vol. 1, pp. 223–247). New York, NY: John Wiley & Sons.
- (33) Hartley, J., Burnhill, P., & Fraser, S. (1974a). Typographical problems of journal design. *Applied Ergonomics*, 5(1), 15–20.
- (34) Hartley, J., & Davies, I. K. (Eds.). (1978). *Contributions to an educational psychology* (1<sup>st</sup> ed.). (Vol. 1). New York: Kogan Page, London/Nichols Publishing Company.
- (35) Hartley, J., Fraser, S., & Burnhill, P. (1974b). A selected bibliography of typographical research relevant to the production of instructional materials. *AV Communications Review*, 22(2), 181–190.
- (36) Hartley, J., & Jonassen, D. H. (1985). The role of headings in printed and electronic text. In D. H. Jonassen (Ed.), *The technology of text: Principles for structuring, designing, and displaying text* (1<sup>st</sup> ed., Vol. 2, pp. 237–263). Englewood Cliffs, NJ: Educational Technology Publications.
- (37) Hartley, J., Young, M., & Burnhill, P. (1975). On the typing of tables. *Applied Ergonomics*, 6(1), 39–42.
- (38) Kilian, C. (1996–2001). Effective web writing (1<sup>st</sup> ed.), [web page]. CMP Media, Inc. Available: [wysiwyg://157/http://www.webtechniques.com/archives/2001/02/kilian](http://www.webtechniques.com/archives/2001/02/kilian) [2001, January 16].
- (39) King, T. W. (1999). Assistive technology: Essential human factors (1<sup>st</sup> ed.) (Vol. 1). Boston, MA: Allyn & Bacon.
- (40) Lay, M. M., Wahlstrom, B. J., Rude, C., Selfe, C., & Selzer, J. (2000). *Technical communication*. (2<sup>nd</sup> ed.). (Vol. 1). Boston, MA: Irwin McGraw-Hill.
- (41) Legge, G. E., Ahn, S. J., Klitz, T. S., & Luebker, A. (1997). Psychophysics of reading—XVI. The visual span in normal and low vision. *Vision Research*, 37(14), 1999–2010.
- (42) Legge, G. E., Pelli, D. G., Rubin, G. S., & Schleske, M. M. (1985). Psychophysics of reading—I. Normal vision. *Vision Research*, 25(2), 239–252.
- (43) Legge, G. E., & Rubin, G. S. (1986). Psychophysics of reading. IV. Wavelength effects in normal and low vision. *Journal of the Optometric Society of America*, 3(1), 40–51.
- (44) Legge, G. E., Rubin, G. S., & Luebker, A. (1987). Psychophysics of reading—V. The role of contrast in normal vision. *Vision Research*, 27(7), 1165–1177.
- (45) Lighthouse. (1998–2001, March 16). *The Lighthouse, Inc.* (1998), [web]. The Lighthouse, Inc. Available: <http://www.lighthouse.org> [1998, February 9].
- (46) Lighthouse, T. (1995). Print legibility and partial sight: Guidelines for designing legible text. New York, NY: The Lighthouse, Inc.
- (47) Lightstone, A. (1997, September). Special filters on reading: The Wilkins rate of reading tests. *Optician*, 5620, 20–21.
- (48) Lynch, P. J., & Horton, S. (1999). *Web style guide: Basic design principles for creating web sites*. (1<sup>st</sup> ed.). (Vol. 1). New Haven: Yale University Press.
- (49) Mansfield, J. S., Legge, G. E., & Bane, M. C. (1996–2001, April 15, 2000). *Psychophysics of reading. XV. Font effects in normal and low vision* (1996), [web]. Vision Psychology, The University of Minnesota. Available: <http://vision.psych.umn.edu/www/people/stevem/iovs95.html> [2001, February 9].
- (50) Mansfield, J. S., Legge, G. E., & Bane, M. C. (1996b). Psychophysics of reading: XV: Font effects in normal and low vision. *Investigative Ophthalmology & Vision Science*, 37(8), 1492–1501.
- (51) Mathes, J. C., & Stevenson, D. W. (1991). *Designing technical reports: Writing for audiences in organizations*. (2<sup>nd</sup> ed.). (Vol. 1). New York, NY: Macmillan.
- (52) Meares, O. (1980). Figure/ground, brightness contrast, and reading disabilities. *Visible Language*, 14(1), 13–29.
- (53) Morrison, G. R., Ross, S. M., O'Dell, J. K., Schultz, C. W., & Higginbotham Wheat, N. (1989). Implications for the design of computer-based instruction screens. *Computers in Human Behavior*, 5(1), 167–173.

- (54) National Technology Access Program. (1998). *Creating applications accessible to people who are visually impaired* (June), [web]. National Technology Access Program. Available: <http://tap.gallaudet.edu/> [2001, February 9].
- (55) Nielsen. (2000). *Designing for web usability*. (1<sup>st</sup> ed.). (Vol. 1). Indianapolis, IN: New Riders Publishing.
- (56) Paterson, D. G., & Tinker, M. A. (1929). Studies of typographical factors influencing speed of reading: VI. Black type versus white type. *The Journal of Applied Psychology*, 13(3), 241–247.
- (57) Paterson, D. G., & Tinker, M. A. (1931). Studies of typographical factors influencing speed of reading: Black type versus white type. *The Journal of Applied Psychology*, 13(3), 241–247.
- (58) Paterson, D. G., & Tinker, M. A. (1932). Studies of typographical factors influencing speed of reading: X. Style of typeface. *The Journal of Applied Psychology*, 16, 605–613.
- (59) Paterson, D. G., & Tinker, M. A. (1940). *How to make type readable: A manual for typographers, printers, and advertisers, based on twelve years of research involving speed of reading tests given to 33,031 persons*. (1<sup>st</sup> ed.). (Vol. 1). New York, NY: Harper & Brothers.
- (60) Philly Inquirer, T. P. (2000). Web site may intrigue the designer, but what about audience? (1st), [web page]. Philadelphia Newspapers, Inc. Available: <http://www.inq.philly.com> [2001, January 19, 2001].
- (61) Prince, J. H. (1957). Relationship of reading types to uncorrectable lowered visual acuity. *American Journal of Optometry and Archives of American Academy of Optometry*, 34(11), 581–595.
- (62) Prince, J. H. (1958a). New reading material for sub-normal vision subjects. *American Journal of Optometry*, 15, 629–636.
- (63) Prince, J. H. (1958b). New reading material for subnormal vision projects. *American Journal of Optometry and Archives of the American Academy of Optometry*, 35(12), 629–636.
- (64) Prince, J. H. (1959). Special print for sub-normal vision patients. *American Journal of Optometry*, 36, 659–663.
- (65) Prince, J. H. (1960). Visual acuity and reading in relation to letter and word design (Research): Ohio State University Institute for Research in Vision.
- (66) Prince, J. H. (1967). Printing for the visually handicapped. *Journal of Typographic Research*, 1(1), 31–47.
- (67) Reece, G. A. (1992). On-Line document management and methodology: A hypertext solution for dual-delivery documents [On-Line and Multimedia: First Annual Space Coast Documentation Conference]. Melbourne, FL: Harris Corporation and Brevard Technical Journal.
- (68) Reece, G. A. (1993–1994). *An investigation of effective document design principles and strategies to develop a hypertext solution for creating dual-delivery documents (On-line and Paper)*. Unpublished Master of Science (M.S.), Florida Institute of Technology, Melbourne, FL.
- (69) Reece, G. A. (2001). *Text legibility for web documents and low vision*. Unpublished Doctor of Education, The University of Memphis, Memphis, TN. [This document is in preparation.]
- (70) Reece, G. A., & Scheiber, H. J. (1993b). Designing for dual-delivery: On-line and paper—A hypertext solution [Workshop]. Philadelphia, PA: IEEE Professional Communication Society.
- (71) Reece, G. A., & Scheiber, H. J. (1993a). Designing for dual-delivery: On-line and paper—A hypertext solution. Paper presented at the *The New Face of Technical Communication: People, Processes, Products: IPCC 93*, Philadelphia, PA.
- (72) Rehe, R. F. (1974). *Typography: How to make it most legible*. (1<sup>st</sup> ed.). (Vol. 1). Indianapolis, ID: Design Research Publications.
- (73) Royal National Institute for the Blind. (1995–2001). Accessible web design, [web page]. RNIB. Available: <http://www.rnib.org.uk/digital/hints.htm> [2001, January 29].
- (74) Rubinstein, R. (1988). *Digital typography: An introduction to type and composition for computer system design*. (1<sup>st</sup> ed.). (Vol. 1). Reading, MA: Addison-Wesley Publishing Company.
- (75) Shaw, A. (1969). *Print for partial sight* (Research project ). London, England: Library Association.
- (76) Spencer, H. (1968). *The visible word*. (1<sup>st</sup> ed.). (Vol. 1). New York, NY: Hastings House Publishers.
- (77) Stoto, M. A., Behrens, R. A., & Rosemont, C. (1990). *Healthy people 2000: Citizens chart the course*. (1<sup>st</sup> ed.). (Vol. 1). Washington, DC: National Academy Press.
- (78) Stueben, S., & Vockell, E. L. (1993). Reformatting text for learners with disabilities. *Educational Technology*, 34(9), 46–50.
- (79) Sullivan, T., & Manning, K. (1996–1998, November 30). *Could Helen Keller read your page?* (1997, August 15), [web]. pantos.org. Available: <http://www.pantos.org/atw/35412.html> [1997, February 9].
- (80) Text Matters. (2001). Designing to meet the needs of visually impaired people. Text Matters. Available: [http://www.textmatters.com/guides/visually\\_impaired.html](http://www.textmatters.com/guides/visually_impaired.html) [2001, January 16].

- (81) Thomas, C. L. (Ed.). (1997). *Taber's cyclopedic medical dictionary* (18<sup>th</sup> ed.). (Vol. 1). Philadelphia, PA: F. A. Davis Company.
- (82) Tinker, M. A. (1963). *Legibility of print*. (1<sup>st</sup> ed.). (Vol. 1). Ames, IA: Iowa State University Press.
- (83) Tinker, M. A. (1965). Bases for effective reading. (1<sup>st</sup> ed.). (Vol. 1). Minneapolis, MN: University of Minnesota Press.
- (84) Tinker, M. A., & Paterson, D. G. (1944). Eye movements in reading black print on white background and red print on dark green background. *American Journal of Psychology*, 57, 93–94.
- (85) Tomasi, M. D., & Mehlenbacher, B. (1999). Re-engineering examples-based online support systems. *Technical Communication*, 46(1), 55–66.
- (86) Trace. (1997–2001, November 18). *Key issues in assuring that the national information infrastructure (NII) in classrooms is accessible*, [web]. Trace Research and Development Center, Univeristy of Wisconsin. Available: [http:// trace.wisc.edu/docs/2pager/index.html](http://trace.wisc.edu/docs/2pager/index.html) [1997, November 18].
- (87) Tschichold, J. (1967). *Asymmetric typography* (McLean, Ruari, Trans.). (1<sup>st</sup> ed.). (Vol. 1). New York: Best Printing Company, Ltd.
- (88) United States Government Printing Office. (1951). *Typography and design*. (1<sup>st</sup> ed.). (Vol. 1). Washington, DC: United States Government Printing Office.
- (89) Usable Web. (1999-2001). [http:// usableweb.com/](http://usableweb.com/)
- (90) Vanderheiden, G. C., Chisholm, W. A., & Ewers, N. (1997, November 18). Making screen readers work more effectively on the web (1<sup>st</sup>), [web]. Trace Center. Available: [http://www.trace.wisc.edu/text/guideIns/browse r/screen.html](http://www.trace.wisc.edu/text/guideIns/browse/r/screen.html) [1997, November 18].
- (91) White, A. (1987). *How to spec type*. (1<sup>st</sup> ed.). (Vol. 1). New York, NY: Watson–Guptill Publications.
- (92) Williams, R. (1994). *The non-designer's design book: Design and typographic principles for the visual novice*. (1<sup>st</sup> ed.). (Vol. 1). Berkeley, CA: Peachpit Press.
- (93) Williams, R., & Tollett, J. (1998). *The non-designer's web book: An easy guide to creating, designing, and posting your own web site*. (1<sup>st</sup> ed.). (Vol. 1). Berkeley, CA: Peachpit Press.
- (94) Wrolstad, M. E. (1960). Adult preferences in typography: Exploring the function of design. *Journalism Quarterly*, 37(1), 211–223.

Gloria A. Reece  
 Mercer University  
 Information Systems  
 Tift College of Education  
 1400 Coleman Avenue  
 Macon, GA 31207-0001

(478) 301-2590

gareece@bellsouth.net

A senior member of STC, Gloria Reece is a member of the faculty at Mercer University where she teaches courses on information systems topics. She is also author of an invited text, *Writing for Information Systems*, to be published by John Wiley & Sons. Her current teaching and research interests include accessible and user-centered design, integration of technology into learning, issues in human-computer interaction, and applications of Unified Modeling Language (UML) to analysis and design of information systems.