



# How to Design Library Websites to Maximize Usability

## CONTENTS

|                  |   |
|------------------|---|
| <i>Page 2</i>    | Introductory Comments                   |
| <i>Pages 3-4</i> | Matching the System and User Activities |
| <i>Pages 5-7</i> | Flexibility and Efficiency of Use       |
| <i>Page 8</i>    | Orientation and Navigation              |
| <i>Page 9</i>    | Page Layout                             |
| <i>Page 9</i>    | Hypertext and Linking                   |
| <i>Page 10</i>   | Consistency                             |
| <i>Page 11</i>   | Aesthetics and Graphics                 |
| <i>Page 12</i>   | Accessibility                           |
| <i>Page 13</i>   | Usability Testing                       |
| <i>Page 14</i>   | Ask UCD                                 |
| <i>Page 15</i>   | References                              |
| <i>Page 16</i>   | Recommended Resources                   |

### *Author and Editor*

**CHRIS JASEK**

**Elsevier User Centered Design Group Manager**

### *Produced by*

**Library Connect, in collaboration with the  
Elsevier User Centered Design Group**



**2007**

Library Connect Editorial Office  
**ELSEVIER**

525 B Street, Suite 1900  
San Diego, CA 92101, USA  
Phone: (+1) 619.699.6283  
libraryconnect@elsevier.com

In a study of library users' requirements for a successful digital library, "almost all the participants considered usability as the most important criterion for a useful digital library" (Xie, 2006). Today's librarians truly understand the importance of usability and recognize the importance of making sure library websites are easy to navigate, so users can find their way quickly to e-resources. But where's a busy librarian to begin?

This pamphlet offers a short set of simple-to-implement guidelines to help librarians design usable library websites. The guidelines are based on a survey of literature on library website design and usability testing, results of usability reviews conducted by Elsevier for library customers and established best practices in website usability.



Chris Jasek

Working with library website usability is at the core of the business of Elsevier's User Centered Design Group. Whether we are reviewing usability of specific library websites to help individual customers, or assisting in design of electronic services and products offered by Elsevier, usability is at the center of our attention.

Since 2003, Elsevier's User Centered Design Group has conducted usability reviews of academic library websites including the University of Manchester library site ([www.man.ac.uk](http://www.man.ac.uk)) and the Queen's Medical Center Hawaii Medical Library site ([www.hml.org](http://www.hml.org)). Elsevier's information technology experts headquartered in Europe have also performed usability reviews of selected library websites, such as the Red de Bibliotecas del CSIC site ([www.csic.es/cbic/cbic.htm](http://www.csic.es/cbic/cbic.htm)) and the University of Pretoria site ([www.ais.up.ac.za](http://www.ais.up.ac.za)).

In all usability reviews Elsevier conducts on behalf of library customers, we use heuristic evaluation. In this technique, usability experts review a website according to established usability heuristics and identify positive and negative factors influencing usability of the site. Each expert does an independent analysis and then results are combined into a single report.

Our library customers have let us know our usability reviews deliver real value. Given our customers' appreciation and that we can only provide a small number of in-depth reviews of library websites per year, we have decided to offer you this pamphlet.

As you read on, you'll discover how to be your own usability expert. Common sense and proven guidelines, such as those listed here, can help you evaluate the design of your own library website and improve it.

Kind regards,

Chris Jasek  
Manager, User Centered Design Group, Elsevier, Miamisburg, OH, USA

**Chris Jasek** earned his BS in computer science and a master's degree in human factors engineering from the University of Illinois, and then started his career with Reed Elsevier. For the past eleven years, while working for LexisNexis and Elsevier, he has helped design and ensure usability of ScienceDirect, Scopus, nexis.com and other information products. Today Chris leads Elsevier's User Centered Design Group, which he helped form.

The User Centered Design Group each year involves hundreds of librarians and users — invited from academic institutes worldwide — in testing Elsevier's electronic products in lab or office settings. Beyond hands-on or lab-based usability testing of Elsevier products, this group performs usability testing of library websites via the heuristic technique. Further, the team conducts usability research to make sure Elsevier's e-products of the future continue to meet customers' high standards and changing needs.



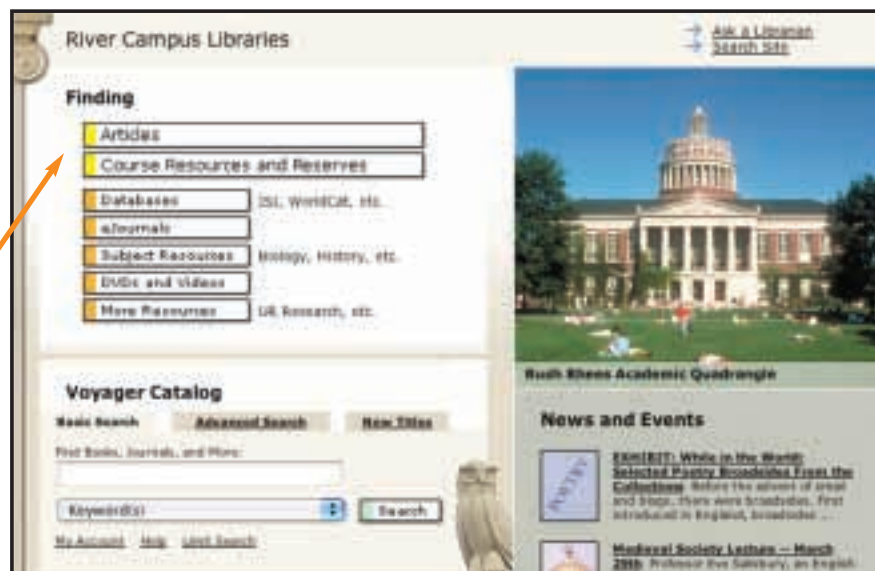
## Organize your site based on users' tasks and their frequency

Organize your library website as a one-stop shop to meet users' research needs and not to reflect the administrative structure of the library (Crowley, Leffel, Ramirez, Hart & Armstrong, 2002). Too often library websites are organized from the perspective of librarians, who know the structure of their sites in great detail.

Research conducted by Elsevier's User Centered Design Group suggests a library website should be organized around the following user tasks. These are listed according to their importance to users or the frequency with which users engage in these tasks.

1. Conducting research to find materials such as journal articles and books
2. Finding course materials such as lecture notes, reserved books, or other materials or links related to certain classes
3. Finding user account information such as checked-out books or fines
4. Finding library information such as locations and hours of operation
5. Getting help in using a library and library website

An academic library website designed to facilitate tasks listed above would assign the most space and prominence to the first task, conducting research. The design of the University of Rochester's River Campus Libraries homepage shows the number-one priority is helping users meet their research needs.



Most users visit a library website to find articles, journals, books or other materials. Devoting most space on your library's website to helping your users find information and perform research shows you understand their needs. The University of Rochester's River Campus Libraries site demonstrates such understanding at [www.lib.rochester.edu](http://www.lib.rochester.edu)

*"The biggest mistake library websites make is not giving enough space to the task 85% of people come to the sites for — finding research materials like journal articles."*

— Chris Jasek (2004), User Centered Design Group Manager, Elsevier, Miamisburg, OH, USA

## MATCHING THE SYSTEM AND USER ACTIVITIES

### Make your website search clear and offer it on your homepage

Finding information is a library website user's primary goal, so it makes sense to offer a search function on your homepage. Harpel-Burke (2005) reported that only 65% of medium-sized library homepages offered a search function.

Be sure users can easily see and understand what materials or content your search facility searches. Most users expect a library website search box to search library content (e.g., books and journals). If your search facility searches only your library's website and does not search your library's catalog, explicitly indicate this is the case.

### Do not use librarian terminology

Try to use terms meaningful to users and clearly distinguishable from other terms. For example, you might want to use the terms "Books" or "Find a Book" rather than "online catalog," "OPAC" or an invented name like "PremiereCat." Another strategy is to offer a short description of a term, e.g., "Journals – fulltext journal articles."

Usability studies have shown many users do not understand simple library terms and concepts like catalog, resources, online database, citation, reserves, reference or special collections (Crowley et al., 2002; Dickstein & Mills, 2000). Users also have difficulty differentiating between "electronic journals" and "databases and indexes" (Cockrell & Jayne, 2002). Your users might not really understand that "electronic journals" offer the fulltext of journal articles online and "databases and indexes" provide searching across abstracts of journal articles.

Perhaps the best way to ensure you are using meaningful terminology is to do some usability testing with your own users. This means you need to see what happens when researchers use your library website.

*"The average user success rate for finding journal articles or article databases is **53%** (in 19 tests at 13 libraries reporting this information). Narrative descriptions suggest that terminology is a major factor."*

— John Kupersmith (2007), "Library Terms That Users Understand"  
[www.jkup.net/terms.html](http://www.jkup.net/terms.html)

### Ensure good performance

To increase the likelihood your library website won't suffer from poor performance, regardless of the power or reliability of your hardware, optimize your page design for download speed.

Don't place too much content on pages. Too much content can make them excessively large and slow to download. For example, you might steer clear of listing your whole e-journals collection on one page, because it might contain hundreds or thousands of journals.

Over 90% of users access library websites remotely (OCLC, 2002). Most are using DSL connections or faster connections, but some users still rely on slow dial-up connections. Designing for download speed will give your remote users a better overall experience.

**Organize information in multiple ways**

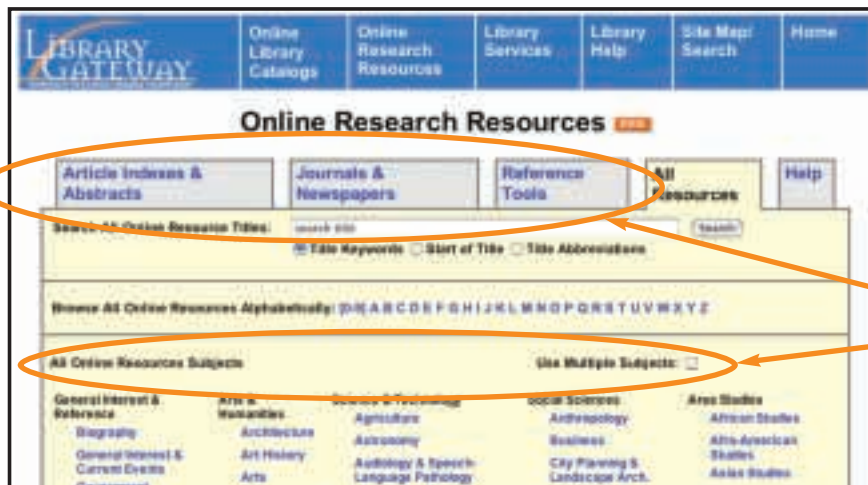
Make it possible for users to find information by following a few clear paths. This increases the likelihood your users will be successful when using your library website.

■ **Organize information by type of material, subject and course**

Some users come to library sites knowing the type of material they are looking for. For example, graduate students and professors often want to search only for journal articles because they are more important in high-level research than books or reference materials. Labeling resources by content type, such as “journals, books, DVDs/videos,” guides users to materials they want.

In many cases users are unaware of what resources are available to them (Adams & Blandford, 2005). Organizing material by subject helps users get a quick overview of resources available in particular areas and can provide good starting points for people in specific fields. For example, you might provide a “Computer Science” page listing your library’s journals, key reference works, databases and selected free online resources for this area. Or, on your main e-journals page, you could list all journals in computer science.

Also consider organizing information resources by course name and number. According to Reeb and Gibbons (2004), “Undergraduate students’ mental model is one focused on courses and coursework, rather than disciplines.” They concluded from their usability studies that undergraduate students do not relate well to subject guide pages and find resources organized by course more usable.



On the Online Research Resources page provided through the University of Illinois at Urbana-Champaign’s Library Gateway, resources are organized by type and by subject. The page appears at [www.library.uiuc.edu/orr](http://www.library.uiuc.edu/orr)

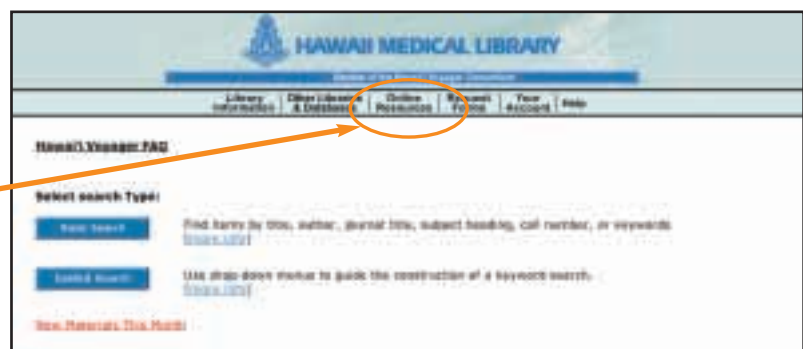
■ **Crosslink information when possible**

Crosslinking different types of information and offering multiple access points help users find what they are looking for (Xie, 2006).

What’s a real-life example of a situation calling for crosslinking? Sometimes users enter an Online Public Access Catalog or OPAC, thinking it searches journal or magazine articles. If your OPAC uses a federated search tool, users at this point may be in good shape. If your OPAC doesn’t search across your library’s proprietary databases, by including in your OPAC a link to your library’s main e-journals page, you help users find what they want.

For more about crosslinking, see “How Do I Find an Article? Insights from a Web Usability Study” by Cockrell and Jayne (2002).

The OPAC of the Queen’s Medical Center Hawaii Medical Library includes a link to the library’s online resources. The library catalog is available at <http://hml.org>



## FLEXIBILITY AND EFFICIENCY OF USE

### Minimize the number of clicks users must make

Place links to different types of research materials and sources (such as electronic journals, databases or OPACs) right on the homepage of your library website. Most users come to a library site wanting to do research, and the shorter their paths, the happier they are.

In 2001, a survey of 105 academic library websites showed 67 offered homepages linking directly to lists of e-journals available through the libraries (Rich & Rabine, 2001). It's good news for users that on 64% of the homepages examined, e-journals were just one click away. But it's too bad that over one-third, 36% in fact, of the library sites could have offered users a shorter path.

Beyond offering direct links from your library homepage to lists of e-journals, you might even want to offer links to frequently used databases (Crowley et al., 2002).

Helping shorten researchers' paths, the homepage of the Houston Academy of Medicine – Texas Medical Center Library offers a link to Scopus. The page appears at <http://resource.library.tmc.edu>



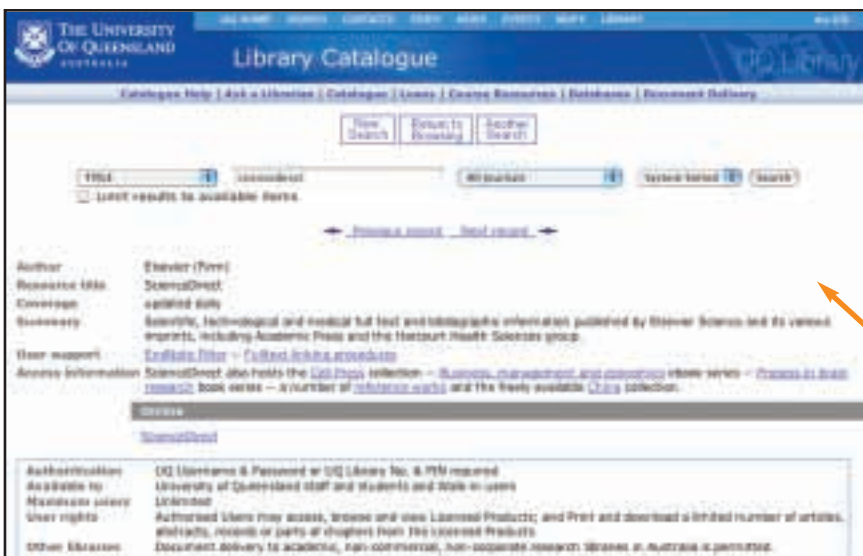
An easy way to shorten researchers' paths is to feature a Scopus HTML Feed, such as this one on Baystate Health's Health Sciences Library homepage at <http://libraryinfo.bhs.org>. All titles in a Scopus HTML Feed are linked to Scopus. When a user affiliated with an organization licensed to Scopus clicks on a title in a Scopus HTML Feed, the user is taken into Scopus. There the user can get more information on the publication and if authorizations are in place can click through to the fulltext. The user can also get more information on the author's publication history and citation counts. This screenshot shows a Scopus HTML Feed created via instructions at [www.info.scopus.com/htmlfeeds](http://www.info.scopus.com/htmlfeeds)

**Explain details to help users select and access resources**

Offer a good description of each digital database and what it covers (Crowley et al., 2002). Listing databases by name only is not enough. Most users are not aware of exactly what type of content a specific database contains. Hampered by lack of knowledge, users experience difficulty quickly deciding which databases are good resources to meet particular research needs.

Offering brief but excellent descriptions can help speed researchers on their way and keep them happy with your library’s site. It is also a good practice to specifically mark the most used or recommended databases so users can easily find them.

Users like to know how they can access materials. Is the fulltext available electronically? If so, from home or campus only? Is a password needed? Explain up front the most critical details about access, and you help users obtain needed content.



Brief descriptions of electronic resources such as ScienceDirect appear in the catalog offered on the UQ Library website at <http://library.uq.edu.au>

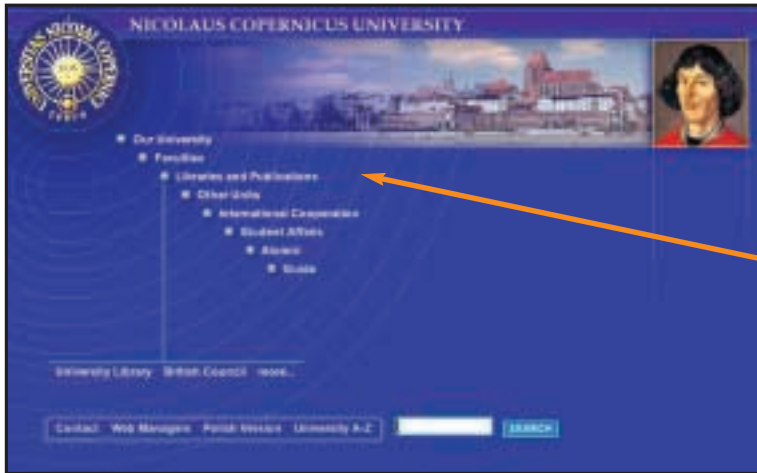
*"The ultimate goal of digital libraries is to serve users. That is why digital libraries need to keep in mind their audience in order to present information to meet their needs."*

— Hong (Iris) Xie (2006), "Evaluation of Digital Libraries: Criteria and Problems from Users' Perspectives"  
[www.sciencedirect.com](http://www.sciencedirect.com)

## ORIENTATION AND NAVIGATION

### Link to your library website directly from your institution's homepage

Never underestimate the importance of a direct link from your institution's homepage to your library's homepage. In a study conducted in 2000, Bao surveyed the homepages of 143 institutions. He found that while only 57% of the organizations' homepages offered links to their libraries' homepages, such links can be very important.



A link to the university's library homepage appears on the Nicolaus Copernicus University homepage at [www.umk.pl/en](http://www.umk.pl/en)

*"The location of a library home page link on its parent institution's home page will determine the visibility of a library and will affect the effective use of the library's online, Web-based resources."*

—Xue-Ming Bao (2000), "Academic Library Home Pages: Link Location and Database Provision"  
[www.sciencedirect.com](http://www.sciencedirect.com)

### Use consistent navigation

To orient users to your site's resources, use one navigation bar, use it consistently and use it well. Usually a navigation bar appears at the top of every page, as a series of buttons or tabs. By highlighting the tab or button correlating with the user's current location on your library website, you provide a visual clue and keep the user from getting lost.

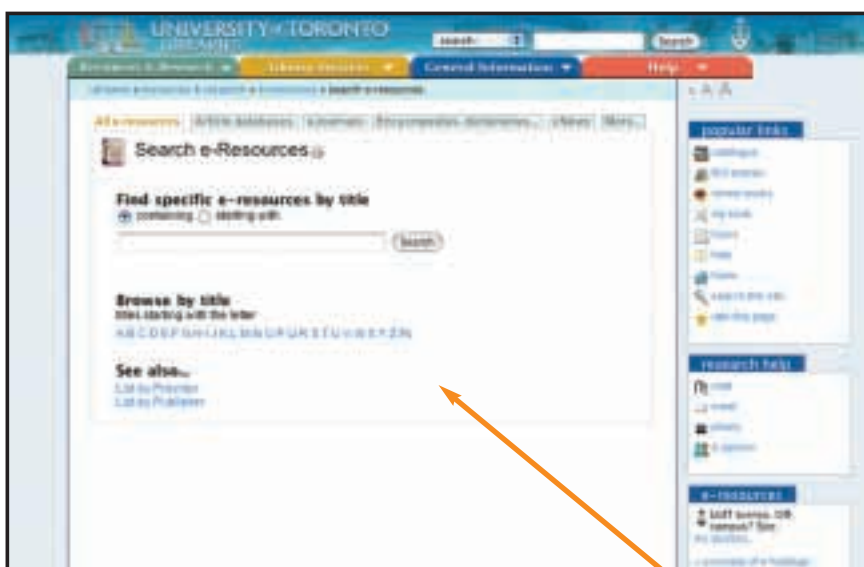
To give another clue to a user's location on your site, you might also include a "breadcrumb" trail indicating the location of the page the user is currently visiting relative to the homepage (e.g., Home > Resources > eJournals). For more on breadcrumb trails, see "Breadcrumb Navigation: An Exploratory Study of Usage" by Lida, Hull and Pilcher (2003).

A breadcrumb trail available throughout the site indicates the user's location on the Utrecht University Library website at [www.library.uu.nl/library/12483main.html](http://www.library.uu.nl/library/12483main.html)



## Use page real estate wisely

Make sure the main content of each page on your website gets as much real estate as possible. Try to minimize the amount of space the site's logo and navigation bar occupy on the top of the pages, so users can see more of each page's main content without scrolling. The University of Toronto Libraries keep their site's navigation area comparatively small, allowing more space for each page's main content.



The largest area goes to the main content, when page real estate is used wisely as on the University of Toronto Libraries page at <http://main.library.utoronto.ca/eir/resources.cfm>

## HYPertext AND LINKING

### Treat links according to conventions

Underline links or put them in a color that is different from any other text on your website. Also be sure to use a different color to indicate links users have visited. Following these conventions helps users identify clickable links and any already visited. Keep the color for clickable links consistent throughout your site, and keep the color for visited links consistent throughout your site.

*“People get lost and move in circles when websites use the same link color for visited and new destinations. To reduce navigational confusion, select different colors for the two types of links.”*

— Jakob Nielsen (2004), “Change the Color of Visited Links”  
[www.useit.com/alertbox/20040503.html](http://www.useit.com/alertbox/20040503.html)

## CONSISTENCY

### Provide a help link on every page

Place a help link in the upper right corner of every page. This way, when users need help, they know where to find it. Make help the central place for various help tools: help text, tutorial videos, live chat, question submittal form and so on. It is best if your help pages are context-sensitive and display information about the page the user was viewing when he or she clicked the help link. It is also nice to display help in a smaller popup window so the user can continue to view the rest of your website.

### Use consistent design elements

Across all pages of your website use fonts and colors consistently for a uniform and professional appearance. Also strive to be consistent in the layout of pages, use of terminology or wording, and how your site allows users to interact with it.



The KAIST Digital Science Library website, demonstrating consistency in design, is available at [www.kaist.edu](http://www.kaist.edu)

*"The Elsevier offer to evaluate our library website was very helpful. This was the 1st time we have done something substantial to evaluate our website (although we know our site is not perfect). No other vendor does, or has offered to do something of this kind for us. The review was free, which was very welcome of course (we would normally have expected to be charged for something like this). We are very happy with the professional manner in which the review report was presented, via an online meeting, as well as the subsequent follow-up presentation in person."*

— Agnès Ponsati (2004), CSIC Libraries Coordination Unit Director, Consejo Superior de Investigaciones Científicas, Madrid, Spain

## Use few colors and minimal graphics

Use only three or four matched colors in the design of your website to make it more aesthetically pleasing and prevent a circus-like appearance. Avoid or minimize use of animated or flashing or scrolling text, as many users find it annoying or think it is an advertisement. By using complementary colors and few graphics, a library website can enhance its appeal.



The Information Services & Systems site of King's College London uses few colors and minimal graphics, as shown at [www.kcl.ac.uk/iss](http://www.kcl.ac.uk/iss)

*"We know our library website is essential for researchers and students as a main point-of-entry to access electronic journal resources and that the usability of the website is instrumental in helping users find information they need. That's why we're so delighted to see simple guidelines, offered by experts such as those with Elsevier."*

— Monica Hammes and Hilda Kriel (2004), Academic Information Service, University of Pretoria, South Africa

### Make your site accessible

Follow the W3C's recommendations for making websites accessible. For more on the World Wide Web Consortium and its recommendations, see [www.w3.org/WAI](http://www.w3.org/WAI).

When you improve usability for visually impaired persons or users with disabilities, you also make your site more accessible in a wide variety of environments, like dark rooms and bumpy airplane rides.



Details on ScienceDirect's accessibility appear at [www.info.sciencedirect.com/using/access/accessibility](http://www.info.sciencedirect.com/using/access/accessibility)

*“When it comes to accessibility for the blind, ScienceDirect is really in very good shape. I feel that the long-term support of these issues will advance the educational and career opportunities in areas where the blind had previously limited options.”*

— Judith Dixon (2002), Consumer Relations Officer, National Library Service for the Blind and Physically Handicapped, Washington, DC, USA

## Test your site for usability

Conduct a usability study and you can make sure your library site is meeting your users' needs.

The preceding guidelines — backed by usability studies and based on best practices — can help improve usability of your library website. But nothing compares to observing your patrons as they navigate your own site and seeing first-hand where they encounter difficulties.

Informal usability studies can take little time and money and yet provide valuable data. See *The Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests* by Jeffrey Rubin (1994) or *Usability Engineering* by Jakob Nielsen (1993) for more information.

Tracking usage and repeating usability testing, after website changes have been made, should indicate if improvements contribute to a better experience for your users.

The following articles provide excellent discussion of recent library website usability studies.

- George, C. A. (2005). Usability testing and design of a library website: An iterative approach. *OCLC Systems & Services*, 21(3), 167-180.
- Stephan, E., Cheng, D. T., & Young, L. M. (2006). A usability survey at the University of Mississippi Libraries for the improvement of the library home page. *The Journal of Academic Librarianship*, 32(1), 35-51.  
[www.sciencedirect.com/science/journal/00991333](http://www.sciencedirect.com/science/journal/00991333)
- Turnbow, D., Kasianovitz, K., Snyder, L., Gilbert, D., & Yamamoto, D. (2005). Usability testing for web redesign: A UCLA case study. *OCLC Systems & Services*, 21(3), 226-234.
- VandeCreek, L. M. (2005). Usability analysis of Northern Illinois University Libraries' website: A case study. *OCLC Systems & Services*, 21(3), 181-192.
- Ward, J. L. (2006). Web site redesign: The University of Washington Libraries' experience. *OCLC Systems & Services*, 22(3), 207-216.

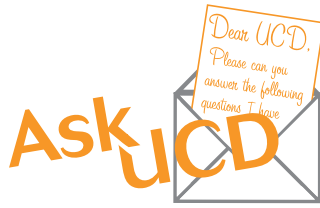


University of West Florida Curriculum Materials Library Director Jeannie Kamerman (on the left) and Elsevier User Centered Design Group Manager Chris Jasek discuss library website usability at the ALA Annual Conference in 2006.

*"The most common usability test is often called the walk through or talk aloud, where the user is observed performing certain tasks and asked to share his thought process with the observer who is taking notes. He is asked to tell what he might click on next and what he expects to see. This frequently reveals where users are stumped, whether by unfamiliar terminology, unclear navigation or poor screen layout.*

*"... usability testing does not have to be an elaborate process. It's better to have informal 'checks' throughout the development cycle than to wait till the end to 'test' the final product, when any redesign is costly. Usability testing ideally is conducted early and often as an integral part of the design process."*

— Judy Luther (2004), "User Centered Design = Successful Products"  
[www.charlestonco.com/features.cfm?id=143&type=np](http://www.charlestonco.com/features.cfm?id=143&type=np)



In 2003, information professionals attending Library Connect presentations at library conferences posed questions about the usability of library websites. Since then, the *Library Connect Newsletter* has featured the “Ask UCD” column which presents usability questions and answers. Chris Jasek and Tom Noonan, both with Elsevier’s User Centered Design Group, serve as authors for the column.

To view “Ask UCD” questions and answers covered so far, please browse

*Library Connect Newsletter* issues available at [www.elsevier.com/libraryconnect](http://www.elsevier.com/libraryconnect).

Following is a sampling of questions and answers featured to date in “Ask UCD.”



*Tom Noonan earned his BA in psychology and an MA and PhD in experimental psychology, all from the University of Louisville. He began his career with IBM and has also worked with a start-up venture and with Circuit City, Inc. Since 2001, Tom has worked for Elsevier. Today he serves as a member of Elsevier’s User Centered Design Group and holds the position of senior human factors engineer.*

**Q: How can I convince my co-workers that our library Web pages aren’t very usable?**

**A:** Opinions just don’t seem to cut it when discussing usability and design; you’ve got to provide colleagues with data that’s tough to brush aside. To get that data you’re going to need to run your own usability test or have someone else run it for you. If your test data shows, for example, 7 out of 10 users could not locate the *Journal of Criminal Justice* you’ve found some pretty hard evidence that your library website is not very usable. In most cases the usability of your website will not be this disastrous, but as a result of testing you’ll collect lots of data helpful in improving the efficiency, labeling and navigation of your website.

Your users deserve the best service and user experience you can offer and since most users access the library through your website it makes sense to pay a lot of attention to usability.

Source: Jasek, C. (2005, August). Ask UCD. *Library Connect Newsletter*, 3(3). [www.elsevier.com/libraryconnect](http://www.elsevier.com/libraryconnect)

To send a question to “Ask UCD,” drop a line to [libraryconnect@elsevier.com](mailto:libraryconnect@elsevier.com)

**Q: When I test the usability of my library website, who do I recruit as test participants and what do I need to keep in mind?**

**A:** Identifying users to participate in usability testing involves a straightforward process. First you must identify your types of users. Almost every website has multiple audiences who want to use the site in different ways. Different users have different needs and expectations. Concentrate on the tasks that you have designed your site to enable. What types of users most need to accomplish the tasks? For example, are these tasks that library staff, undergraduates or experienced researchers perform?

Once you have identified types of users, select a variety of users from the primary user groups. Try to sample a reasonable cross section of the user groups. Don’t limit your test to co-workers or those anxious to be test participants.

Now that you have your users lined up, keep the following in mind:

- Keep the test short. People are more willing to volunteer if the time required is short. If it isn’t necessary that each person attempt each task, it’s okay to have different users attempt subsets of the tasks.
- If feasible, test the site at a workstation near the users or in their offices. If you can test the site when and where it is convenient to them, you are more likely to get volunteers.
- When testing, don’t be judgmental and have patience. Some people get nervous in such a situation and take some time to become comfortable. Be considerate. Remind them that you are testing the product, not them!
- If the test requires that you interact with or interview the user, try to have someone else take test notes. It’s difficult to interact gracefully with a user and, at the same time, record your observations.
- Finally be polite and maybe they’ll volunteer again. Remember they are helping you.

Source: Noonan, T. (2006, October). Ask UCD. *Library Connect Newsletter*, 4(4). [www.elsevier.com/libraryconnect](http://www.elsevier.com/libraryconnect)

- Adams, A., & Blandford, A. (2005). Digital libraries' support for the user's "information journey." In *Proceedings of the 5th ACM/IEEE-CS Joint Conference on Digital Libraries* (pp. 160–169). Denver, CO: ACM Press.
- Bao, X. (2000). Academic library home pages: Link location and database provision. *The Journal of Academic Librarianship*, 26(3), 191–195.  
DOI: 10.1016/S0099-1333(00)00098-7  
[www.sciencedirect.com/science/journal/00991333](http://www.sciencedirect.com/science/journal/00991333)
- Cockrell, B. J., & Jayne, E. A. (2002). How do I find an article? Insights from a web usability study. *The Journal of Academic Librarianship*, 28(3), 122–132.  
DOI: 10.1016/S0099-1333(02)00279-3  
[www.sciencedirect.com/science/journal/00991333](http://www.sciencedirect.com/science/journal/00991333)
- Crowley, G. H., Leffel, R., Ramirez, D., Hart, J. L., & Armstrong, T. S., II. (2002). User perceptions of the library's web pages: A focus group study at Texas A&M University. *The Journal of Academic Librarianship*, 28(4), 205–210.  
DOI: 10.1016/S0099-1333(02)00284-7  
[www.sciencedirect.com/science/journal/00991333](http://www.sciencedirect.com/science/journal/00991333)
- Dickstein, R., & Mills, V. (2000). Usability testing at the University of Arizona Library: How to let the users in on the design. *Information Technology and Libraries*, 19(3), 144–151.
- Harpel-Burke, P. (2005). Library homepage design at medium-sized universities. A comparison to commercial homepages via Nielsen and Tahir. *OCLC Systems & Services*, 21(3), 193–208.
- Kupersmith, J. (2007). *Library terms that users understand*.  
[www.jkup.net/terms.html](http://www.jkup.net/terms.html)
- Lida, B., Hull, S., & Pilcher, K. (2003). Breadcrumb navigation: An exploratory study of usage. *Usability News*, 5(1).  
<http://psychology.wichita.edu/surl/usabilitynews/51/breadcrumb.htm>
- Luther, J. (2004). User centered design = successful products. *The Charleston Advisor*, 5(3).  
[www.charlestonco.com/features.cfm?id=143&type=np](http://www.charlestonco.com/features.cfm?id=143&type=np)
- Nielsen, J. (1993). *Usability engineering*. Boston: Academic Press.
- Nielsen, J. (2004, May 3). Change the color of visited links. *Jakob Nielsen's Alertbox*.  
[www.useit.com/alertbox/20040503.html](http://www.useit.com/alertbox/20040503.html)
- Online Computer Library Center (OCLC). (2002). *How academic librarians can influence students' Web-based information choices*. (OCLC White Paper.) Dublin, OH: Author.  
<http://www5.oclc.org/downloads/community/informationhabits.pdf>
- Reeb, B., & Gibbons, S. (2004). Students, librarians, and subject guides: Improving a poor rate of return. *portal: Libraries and the Academy*, 4(1), 123–130.
- Rich, L. A., & Rabine, J. L. (2001). The changing access to electronic journals: A survey of academic library websites revisited. *Serials Review*, 27(3/4), 1–16.  
DOI: 10.1016/S0098-7913(01)00148-4  
[www.sciencedirect.com/science/journal/00987913](http://www.sciencedirect.com/science/journal/00987913)
- Rubin, J. (1994). *The handbook of usability testing: How to plan, design, and conduct effective tests*. New York: John Wiley.
- Xie, H. I. (2006). Evaluation of digital libraries: Criteria and problems from users' perspectives. *Library & Information Science Research*, 28(3), 433–452.  
DOI: 10.1016/j.lisr.2006.06.002  
[www.sciencedirect.com/science/journal/07408188](http://www.sciencedirect.com/science/journal/07408188)



*"ScienceDirect is a well-conceived database that uses an intuitive interface to connect researchers to a wealth of STM resources. A++ in my book!"*

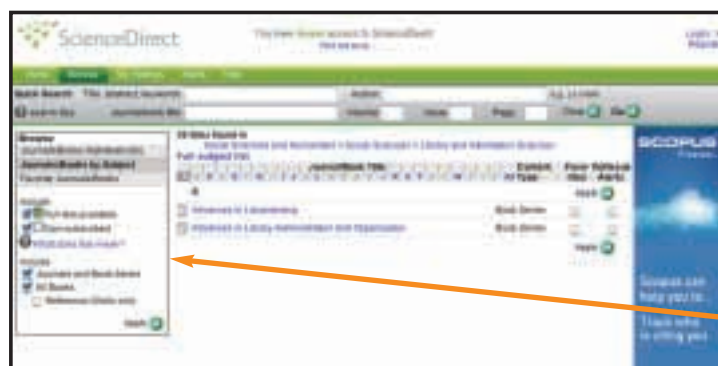
— Jeannie Kamerman, Curriculum Materials Library, Director,  
University of West Florida, Pensacola, FL, USA

## RECOMMENDED RESOURCES

- Brantley, S., Armstrong, A., & Lewis, K. M. (2006). Usability testing of a customizable library web portal. *College & Research Libraries*, 67(2), 146–163.
- Cervone, H. F. (2005). Usability training: An overlooked component in an on-going program of web assessment and development. *OCLC Systems & Services*, 21(3), 244–251.
- Chowdhury, S., Landoni, M., & Gibb, F. (2006). Usability and impact of digital libraries: A review. *Online Information Review*, 30(6), 656–680.
- Covey, D. T. (2002, January). *Usage and usability assessment: Library practices and concerns*. Washington, DC: Digital Library Federation and Council on Library and Information Resources.  
[www.clir.org/pubs/reports/pub105/contents.html](http://www.clir.org/pubs/reports/pub105/contents.html)
- Dee, C., & Allen, M. (2006). A survey of the usability of digital reference services on academic health science library web sites. *The Journal of Academic Librarianship*, 32(1), 69–78.  
DOI: 10.1016/j.acalib.2005.11.001  
[www.sciencedirect.com/science/journal/00991333](http://www.sciencedirect.com/science/journal/00991333)
- Finder, L., Dent, V. F., & Lym, B. (2006). How the presentation of electronic gateway pages affects research behavior. *Electronic Library*, 24(6), 804–819.
- Koff, W. (2004). [Review of the book *Usability testing for library web sites: A hands-on guide* by E. Norlin and C.M.I. Winters]. *Library & Information Science Research*, 26(1), 112–113.  
DOI: 10.1016/j.lisr.2003.11.011  
[www.sciencedirect.com/science/journal/07408188](http://www.sciencedirect.com/science/journal/07408188)
- Krueger, J., Ray, R. L., & Knight, L. (2004). Applying web usability techniques to assess student awareness of library web resources. *The Journal of Academic Librarianship*, 30(4), 285–293.  
DOI: 10.1016/j.acalib.2004.04.002  
[www.sciencedirect.com/science/journal/00991333](http://www.sciencedirect.com/science/journal/00991333)
- Novotny, E. (2004). I don't think I click: A protocol analysis study of use of a library online catalog in the internet age. *College & Research Libraries*, 65(6), 525–537.
- Shropshire, S. (2003). Beyond the design and evaluation of library web sites: An analysis and four case studies. *The Journal of Academic Librarianship*, 29(2), 95–101.  
DOI: 10.1016/S0099-1333(02)00418-4  
[www.sciencedirect.com/science/journal/00991333](http://www.sciencedirect.com/science/journal/00991333)

### Usability Websites

- www.upassoc.org
- www.usability.gov
- www.usabilitynet.org
- www.useit.com
- www.webstyleguide.com



You can find additional usability guidance in books and journals on ScienceDirect. To see library and information science titles on ScienceDirect:

- Go to browse by subject at [www.sciencedirect.com](http://www.sciencedirect.com)
- Select Social Sciences and Humanities
- Select Social Sciences
- Select Journals/Books by Subject
- Select Social Sciences
- Select Library and Information Sciences

## CONTACT INFORMATION

Daria DeCooman  
Library Connect Managing Editor  
Elsevier  
525 B Street, Suite 1900  
San Diego, CA 92101, USA  
Phone: (+1) 619.699.6283  
[libraryconnect@elsevier.com](mailto:libraryconnect@elsevier.com)

Chris Jasek  
User Centered Design Group Manager  
Elsevier  
9443 Springboro Pike  
Miamisburg, OH 45342, USA  
Phone: (+1) 937.865.6800  
[C.Jasek@elsevier.com](mailto:C.Jasek@elsevier.com)