Medium-sized Universities Connect to Their Libraries: Links on University Home Pages and User Group Pages

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From major tasks—such as recruitment of new students and staff—to the more mundane but equally important tasks—such as providing directions to campus—college and university Web sites perform a wide range of tasks for a varied assortment of users. Overlapping functions and user needs meld to create the need for a Web site with three major functions: promotion and marketing, access to online services, and providing a means of communication between individuals and groups.[1] In turn, college and university Web sites that provide links to their library home page can be valuable assets for recruitment, public relations, and for helping users locate online services.

Goals for Web sites may vary for different users. Colleges and universities have a number of potential user groups: current students, faculty, staff, prospective students, donors, alumni, businesses, and media.[2] Because the "fundamental organizing principle in Web site design is meeting users' needs," the organization of the home page should reflect the specific needs and interests of these user groups.[3] By segmenting their home pages into distinct user-group pages, universities may be better able to meet the needs of their various users. Segmentation into subsites for distinct user groups is an effective navigational device that manages complex Web sites with numerous pages and a variety of audiences.[4] As an added benefit to this structure, users should feel more welcome at a subsite that is designed specifically for them.[5]

Middleton, McConnell, and Davidson divided the users of a university Web site into two categories: internal (faculty, staff, and students) and external (prospective students, alumni, donors, parents, community, visitors, and news media).[6] While the needs of these groups overlap, internal users primarily need accessible, useful tools that will help them become productive and successful in their work or educational life. In contrast, external users primarily seek details on academic programs, campus environment, news and events, and contact information.

Along with the university home page in general, the representation of the library on the Web site has also diversified to meet the needs of these different user groups. Faculty, staff, and current students (internal users) may seek out the library for access to information that assists them in the completion of their work. Internal users need access to library services and resources such as course reserves, online databases, the catalog, and interlibrary loan. In all likelihood, internal users frequently will seek a wide variety of information on the library Web page. For external users, however, the library Web site's primary function is for promotion of the institution. As an example, prospective students and their families may compare the library to that of other universities under consideration. Donors, alumni, and members of the business community may be interested in visiting or contributing to the library. Consequently, external users are more concerned with such characteristics of the library as the size and age of the collection, electronic resources, and the actual facilities. Hence, a link to the library is expected to appear more often on the subsites for internal users than on subsites for external users.

Link placement is also important. Web site usability research has demonstrated that links in the upper part of the page in either corner are much more likely to be noticed than links placed elsewhere.[7] Therefore, access to the library from the university home page and associated user group pages can be affected by spatial placement of the link, the need to scroll (below the fold), drop-down menus, direct links, and terminology used for the library. A direct link to the library in a prominent position with comprehensible labeling maximizes the university's investment into the libraries' online resources.

It is important to note that the representation of the library on the university's home page and subsequent user group subsites is not an indication of the worth of the library as perceived by the institution. Although university Web site designers may group the library with general services such as food services or facilities, the absence or presence of a library link, terminology used, and link placement may not manifest the value that the university places on the library. Other factors, such as financial support and involvement in the curriculum and research, also serve to underscore the library's value within the university community. However, as noted by Astroff, the Web page is "one officially approved representation of the university's infrastructure." [8]

Literature review

Several authors have previously dealt indirectly with the association between the university home page and the library home page. In King's 1998 study of home page design of 120 Association for Research Libraries (ARL) institutions, he also looked at the placement of the library link on the associated parent university home page and counted the number of steps from the university home

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page to the library's home page.[9] For the 111 libraries that had parent institutions, he noted that at times it was necessary to search the home page for the library link. Forty-four percent of the library links could be located in one step while 50 percent of the institutions required the user to find the library link in two or more steps. For the remaining home pages, no association between the library and its parent institution could be found.

Dewey analyzed the findability and placement of links to various services on the library home page of twelve of the thirteen member libraries of the Committee on Institutional Cooperation (CIC).[10] She also noted that a direct link to the library from the university home page affects access to these services. CIC institutions fared poorly in this regard, with only five of the twelve institutions having a link to their library home page. For the remaining seven, the link was only found by searching the institution's Web site.

One hundred and thirty-three library Web sites for medium-sized universities (six thousand to thirteen thousand students) were examined for specific features and core components in 2000 with a follow-up study in 2005.[11] Sample size and university type were similar to those in this study. Even in cases where the process was lengthy and complicated, they found in the 2000 study that they were always able to "navigate from the parent institution to the library page either by a direct link or multiple links."[12] However, 32 percent of the institutions in the initial study had no link, logo, or drop-down menu that gave access to the library home page from the university home page. It was noted that the presence of a library icon on the university home page increases the likelihood that students will easily find the library home page. In Tolppanen, Miller, Wooden, and Tolppanen's subsequent study in 2005 of the same set of universities, the percentage of the universities without access to the library home page from the university home page had only dropped to 29 percent.

In a comparison of Web sites of historically black college and university (HBCU) libraries and other public institutions in the southeastern United States, Agingu examined the usefulness of HBCU library Web sites as service providers and information disseminators.[13] Out of sixty-five library Web sites examined, only two libraries were inaccessible from the main university home page. However, she noted that 23 percent of those accessed were identified only after searching the university home page. She also advocated the presence of a direct link on the home page for visibility and ease of location.

In a more recent article, Welch surveyed 106 academic libraries (ARL and non-ARL) to evaluate the use of the library Web site for marketing library resources and services, exhibits, programs, and fundraising.[14] The placement of a link to the library from the university home page was also studied, and the increased visibility of the library through direct links was emphasized as a public relations vehicle for the library. Welch reported that 80 percent of these libraries surveyed had direct links to the library from the institutional home page.

Stover and Zink examined forty library home pages in higher education. Instead of investigating the links from the university home page, they surveyed links from the library home page.[15] Eighty percent of the library home pages in their study linked back to the university's home page. They reasoned that such a link enhanced the library's importance within the overall university community.

Astroff provided the most comprehensive research on access to libraries from university home pages in her study of 111 ARL institutions. Sixty-one percent of the university home pages had visible links to the library home page. Home pages were classified as having no visible link to the library if it was necessary for "the user to make some choice or perform some action before such a link becomes visible."[16] For example, the use of a drop-down menu box or a pathway to the library link via mouseovers was not considered a direct link to the library.

The importance of providing a link to the library from the university's home page was recognized early in the development of university Web sites.[17] Astroff noted that the trend to "organize information by the role the user plays in the university community" developed during her study. She claimed that segmentation into user groups can lead to a "very clean design but one that provides very little information and no place for a visible library link."[18] However, this author contends that a user group design may allow the library link to be more obvious on the home page. By relegating more information on various services to the specific user group, there is more white space on the home page for the library, and the user groups can be provided with information in a more usable format.

This study

This study is unique because it takes into account the trend to organize university home pages by user groups. With a focus on four-year, medium-sized universities, the accessibility of the library on pages targeted to associated user groups as well as accessibility from the university home page in general is examined.

In publications on Web site design, a variety of terms have been used to refer to these groups, such as subsites, user segments, or segmentation; in this paper, the term *user groups* will be used to represent these concepts. In addition, *university* will be used when referring to the college, university, or institution.

Method

University home pages: data set

A data set of home pages from four-year, medium-sized universities with a total student population of eight thousand to thirteen thousand students—full-time and part-time undergraduates and graduate students—was analyzed. University type and enrollment size of the author's home university (Hofstra University) was used as a baseline for comparison to other medium-sized universities. Hofstra University, a private, nonsectarian, coeducational university, is located twenty-five miles east of Manhattan on Long Island in Hempstead, New York.[19] Total enrollment at Hofstra University, including part-time undergraduate, graduate, and School of Law, is approximately thirteen thousand; full-time undergraduate enrollment is 8,067.

In order to insure that a robust data set was obtained, two resources were used to generate a list of comparable universities: the "Compare Academic Libraries" tool from the National Center for Education Statistics (NCES) Web site and *Peterson's College Bound Online*. The NCES comparison tool used data from the *Academic Libraries Survey* (*ALS*) for fiscal year 2002, which collected information from thirty-seven hundred academic libraries in the United States and outlying regions. *ALS* gathered data on libraries with "accredited degree-granting institutions of higher education and on the libraries in non-accredited institutions with a program of four years or more."[20]

The comparison group included universities within 20 percent of Hofstra's total enrollment of thirteen thousand students; the NCES generated list was comprised of 168 universities with enrollments ranging between 9,023 and 13,534 undergraduates. Three Carnegie Classification levels were retained: Doctoral/Research Universities—Extensive (Class 15; n = 16); Doctoral/Research Universities—Intensive II (Class 16; n=25); and Master's Colleges and Universities I (Class 21; n=36). Three categories were eliminated from analysis because they were not comparable to Hofstra's Carnegie Class 16: Master's (Comprehensive) Colleges and Universities II (Class 22), Associate of Arts Colleges (Carnegie Classification 33) and Schools of Engineering and Technology (Class 54). The final list from *ALS* contained 103 libraries.

Similarly, *Peterson's College Bound Online* was limited to colleges with eight thousand to thirteen thousand full-time students, excluding Canada and Puerto Rico, and community colleges. After universities that were duplicated on both *Peterson's* and *ALS* were removed, the list contained ninety universities. Because ARL universities are already studied elsewhere, they were also excluded.

A data set was formed with all universities that appeared on both lists. Finally, because Hofstra University is a private university with a Carnegie Classification 16 (Doctoral/Research Universities—Intensive II), universities with this level were retained if they appeared on either list. Eight universities were then eliminated from the data set because they were either online colleges or colleges that focused on the health sciences only. Some of the universities in the data set were part of a consortium that shared a home page, such as City University of New York (CUNY). Therefore, CUNY Brooklyn, City College, Lehman College, and Queens College were analyzed jointly and considered one home page. However, the CUNY Bernard M. Baruch College was examined separately because it had a unique home page. The final data set examined contained seventy-seven universities.

Software, hardware, and retrieval

Hardware used for the assessment of university pages was a Dell Pentium 4 (CPU 2.66GHz 384 MB of RAM) with a 16-inch, 32-bit color Intel Plug-and-Play Monitor with screen resolution of 1024 by 768 pixels. Software included the operating system (Microsoft Windows XP Professional version 2002) and browser (Microsoft Internet Explorer version 6.0.2600.000). Pages were displayed with no other toolbars than the Internet Explorer address bar. Screen shots of each page used for data collection were copied and retained for future reference.

Criteria examined

Each university home page was surveyed to determine whether there was a link to the library home page. If the university had a library link, additional data were collected. Drop-down menus or mouseovers were considered to be visible links in this study of home pages of medium-sized universities. Additional data on the use of drop-down menus for library links were collected.

If links to the library were displayed in a button bar, banner, or drop-down menu, they may have been due to page grid designs or server limitations. These navigational aids were often recorded as the second link to the library. On the university home page, a link to the library may also be represented in navigation bars or menus along the top or bottom of the university home page. When these navigational aids were present, they were also checked throughout each user group to see if they persisted as part of the structure of subsequent pages.

When there was more than one link to the library, hypertext links in the upper portion were recorded as the first link. Additional hypertext links were numbered according to their location on the page; links in the center were second, and links at the bottom were third. However, if a link was a drop-down menu, but-

ton bar, or banner menu that was the result of a page grid design, location was ignored and the link was always recorded as the last link (either second, third, or fourth).

University home pages were also examined to determine if the user needed to scroll to see the library link. If there was a link to the library from the university home page, the link was tested to see if it led directly to the library home page. Links that led users to a Web page that represented a collection or system of libraries at the parent university were recorded as direct links. University home pages were also examined to see whether there was more than one link to the library home page.

Specific characteristics of each link were examined. The exact terms, such as *Libraries* and *Library Resources,* used to label the library link were noted. Spatial placement of the library link on the university home page or specific user group was determined by dividing the screen into nine sections—upper left, upper center, upper right, center left, middle center, center right, lower left, lower center, and lower right—and noting the location of each library link.

Each site was also examined to determine whether the university had divided its home page for separate user groups. Many of the university home pages were designed to provide entry points to university information for each of these separate user groups. Data were collected for eight common user group categories; these user groups were categorized as external and internal users. Three types of users, Faculty, Staff, and Current Students, were identified as internal users. Where present, as many as five types were identified as external users: Prospective Students, Alumni and Donors, Parents, Visitors and Community, and Business and Media.

Variables examined for each category of user included the presence or absence of a link to the library on each specific user page and the number of links to the library. For the first and second library links, placement of these links and the terminology used to identify the library were recorded.

In some cases, university home pages were hybrid versions of the traditional university home page display and the segmented user group display. In these cases, some user categories were given but the home page as a whole was not segmented into specific user groups. These cases were included in the analysis. However, if the main university home page did not have divisions for user groups, the Web pages were not examined further.

Statistics

Standard two-tailed t-tests were used to compare the number of library links on university home pages, internal user groups, and external user groups. Chi-square tests and contingency tables were used to test for significant variation in link placement and the presence of at least a single library link on internal as opposed to external user group pages.

Results

An examination of home pages of seventy-seven medium-sized universities (eight thousand to thirteen thousand total student population) was undertaken in spring 2005. Thirty-two states and the District of Columbia were included in the sample. The states with the largest number of universities surveyed were New York (n=11), Missouri (n = 8), and Ohio (n = 4). Thirteen of the states were represented by only one university; ten of the states had two universities; and seven states had three universities included. The majority of universities were public (n=58); the rest were private nonsectarian (n=14) and private universities with religious affiliations.

Results of the study are arranged into three main categories: information about the library link on the main university home page, information on the library link within the Web pages for internal, and information on the library link within the Web pages for external user groups.

University home page characteristics

Seventy of the university home pages (91 percent) had an obvious, but not necessarily direct, link to the library home page (table 1). Most of the home pages of medium-sized universities had a direct link to the library home page (83 percent). Sixteen (23 percent) of the university home pages had the link to the library incorporated into a drop-down menu. In some cases, the university provided additional opportunities for the user to find the library on the home page by including a hypertext link along with the drop-down menu. Twenty-four percent of the university home pages had two or more links to the library.

University home page terminology

Terminology used to identify the library on the university home page was fairly uniform. For the first link to the library, all home pages used a phrase that contained the word *library* or its plural. Specifically, the terms Library or Libraries were used by 77 percent of the universities for the first link. Thirteen percent of the universities used a phrase containing the word Library or Libraries along with another term (i.e., Library and Media Center; Libraries and Technology; Library Resources). Nine percent of the universities used the specific name

of the library (i.e., Andruss Library at the Bloomsburg University of Pennsylvania; Booth Library at Eastern Illinois University; Maag Library at Youngstown State University). This terminology pattern was consistent for those Web pages with multiple library links—all used the word Library or its plural.

University home page link placement

Spatial placement of the first library link on the university home page was quite varied. Nearly 29 percent of the universities had a link to the library home page in the center on the left side of the page. Twenty-one percent placed the link to the library in the upper right corner. Overall, the center was the preferred place for the first link to the library; 47 percent of the universities had the first link in the center section (center left, right, or middle) of the home page. Fewer of the links were in the upper part of the university home page; 36 percent of the universities had the first link in the upper section (upper left, right, or center) of the home page. Only 17 percent of the links were in the lower part (lower left, center, or right) of the home page. Of these universities with the link in the lower part of the page, the majority of them (75 percent) required the user to scroll down the page to see this link.

Placement of the second link to the library on the university home page was quite different. For the seventeen libraries with such links, none were in the center area of the home page. Placement of the second link to the library was fairly evenly divided between the upper section (47 percent) and the lower section (53 percent) of the universities' home pages. Because this additional link was in the upper or lower parts of the page, it seems likely that the second link was attributed to a follow-through menu design.

Table 1. University home pages: library links

Criteria Examined	Responses	N= Number for subset	N= for total	%
Is there a link to the library?	Yes	70	*77*	91
	No	7		9
Is it a direct link to the library?	Yes	58	*70*	83
	No	12		17
Is it necessary to scroll to see the library link?	Yes	9	*70*	13
	No	61		87
Is the link part of a drop-down menu?	Yes	16	*70*	23
	No	54		77
Is there more than one link?	1 link	53	*70*	76
	2 links	17		24
What is the term used for the first library link?	Libraries or Library	54	*70*	77
	Library or Libraries and "other"	10		14
	Library "name"	6		9
Where is the first link?	Upper (Left, Center, Right)	25	*70*	36
	Center (Left, Center, Right)	33		47
	Lower (Left, Center, Right)	12		17
Does the menu follow through to the other Web pages?	Yes	52	*70*	74
	No	18		26
Are there user group segments?	Yes	70	*77*	91
	No	2		3
	Some	5		6

The link to the library from the university home page could also be displayed in a button bar along the top, a drop-down menu or a menu along the bottom or one side that is retained throughout the Web site. Specific characteristics, such as placement and terminology, for these links were generally recorded as the second or subsequent link. Seventy-four percent of the universities' Web sites carried the library link through and displayed it on the home page for some or all of the succeeding user groups. Page grid layout or server limitations contributed to some of the user groups' pages having up to four links to the library on their individual home pages. For example, 50 percent of the pages in the Faculty and Staff user category had two or more links to the library.

University home page user group segments

Seventy (91 percent) of the seventy-seven university

home pages had clear user group delineation. In five other cases, the university home page had indistinct user groups; these home pages presented some user groups within the traditional university home page design. These five home pages were included in the analysis of user groups. Only two of the seventy-seven university home pages had no user group segmentation and therefore were discarded from the user segmentation analysis.

All of the seven university home pages with no library link (direct or indirect) had user group segmentation. Of the twelve university home pages that had only an indirect link to the library, eleven had user group delineation. Although data were collected for eight categories of users, the majority of universities had six categories or fewer: Faculty and Staff, Current Students, Prospective Students, Alumni and Donors, Parents and Family, Visitors and Community. The Faculty and Staff categories were combined for this analysis because sixty-seven of the seventy-five universities had Faculty and Staff combined into one user group. Only two of the universities had a separate category for Staff. In one case, California State University, Hayward/East Bay (CSU), the Staff page contained the same information in the same arrangement as the Faculty page. The Staff page did not have a link to the library at the other university (Howard University). Of the seventy-five libraries with user segments, six of them had no category that included Staff.

Only six (8 percent) of the universities had a Business or Media user group represented on any of their university home pages. Three of these had links to the library home page; two of these links were only through a menu bar and one was only through a drop-down menu that appeared throughout the Web pages. Thus, in these cases the link was probably due to a follow-through menu determined by the software design. No further data for this category of user are presented here.

Internal user groups link number

As noted above, data on the user groups were divided into two primary sections: internal and external. The internal users consisted of two types: Faculty and Staff and Current Students. As shown in table 2, 94 percent of the Faculty and Staff group had a link to the library. Of these, 50 percent had two or more links to the library in their Faculty and Staff page. Pages for Current Students had results similar to the Faculty and Staff category; 97 percent provided a link to the library from the student page. For those student pages that had links to the library, 56 percent had only one link and 44 percent had two or more links to the library. Eleven of the Current Student pages had three to four links to the library.

Internal user groups terminology

The Faculty and Staff and the Current Students groups had similar terminology usage, with most of the groups using either Library or Libraries or Library name. The terms Library or Libraries were used most often by both user groups; Faculty and Staff used these two terms 46 percent of the time, Current Students used them in 52 percent of the cases. The university's library name was used on 27 percent of the Faculty and Staff pages and 22 percent of the Current Students pages. Library or Libraries and "other" were used on 18 percent of the Faculty and Staff pages and 11 percent of the Current Students pages.

Internal user groups link placement

Spatial placement of the link to the library for the Faculty and Staff group and the Current Students was fairly widely distributed. The link to the library was placed in the upper part of the page 35 percent of the time for Faculty and Staff and 27 percent for the Current Students. The center of the page was used for the library link 29 percent of the Faculty and Staff pages and 36 percent of the Current Students pages. The link to the library was placed in the lower part of the page 35 percent of the time for Faculty and Staff and 36 percent of the Current Students.

External user groups link number

The external users consisted of four types: Prospective Students; Alumni and Donors; Parents and Family; and Visitors and Community (table 3). Of external users, the Prospective Student group had the highest number of links to the library (74 percent). The other groups had similar percentages of links to the library from their page; 67 percent of the Parents and Family group had links to the library while 60 percent of the Visitors and Community group had links to the library. Only 49 percent of the Alumni and Donors category had links to the library.

External user groups terminology

Terminology used by the external groups was fairly consistent for all groups. For all of the user groups, most of the links were labeled Library or Libraries. The Alumni and Donors group used one of these two terms 72 percent of the time; the Prospective Students group used one of the terms 62 percent of the time. The Parents and Family group used either Library or Libraries for the link 54 percent of the time; Visitors and Community used one of these terms 70 percent of the time. The specific university Library name was used often by two of the groups. Twenty-four percent of the Prospective

Students group used the specific name of the library; the Parents and Family group used Library name 25 percent of the time.

External user groups link placement

Placement of the library link on the four external user group pages was varied, but most of the external user groups had the library link in the upper section of the page. Sixty-four percent of the Alumni and Donors pages, 61 percent of the Visitors and Community pages, 49 percent of the Prospective student pages, and 42 percent of the Parents and Family pages placed the link in the upper portion of the page. The library link was located in the center portion of the page least often by all of the external user groups. For example, the center position for the Prospective Students group was used 22 percent of the time; Alumni and Donors used this position only 11 percent of the time.

Discussion

Links to the library: Comparison with other studies

Comparison to other studies that examined the link to the library on the university home page shows diverse patterns. Although earlier studies that examined the university home page for a link to the library utilized a variety of data sets, criteria, and university types, simple

Table 2. Internal user groups: faculty and staff and current students

		Faculty & staff 1st occur *N*=72			Faculty & staff 2nd–4th occur *N*=43			Current students 1st occur *N*=73			Current students 2nd–4th occur *N*=45		
Question	**Responses**	**set *n*=**	**Total *N*=**	**%**	**set *n*=**	**Total *N*=**	**%**	**set *n*=**	**Total *N*=**	**%**	**set *n*=**	**Total *N*=**	**%**
Is there a link to the library?	Yes	68	72	94				73	75	97			
	No	4		6	NA			2		3	NA		
How many links are there to the library?	1	34	68	50	NA			41	73	56	NA		
	2	26		38				21		29			
	3 to 4	8		12				11		15			
What term is used for the library link?	Libraries or Library	31	68	46	20	43	46	38	73	52	23	45	51
	Library or Libraries & "other"	12		18	15		35	8		11	14		31
	Library name	18		27	3		7	16		22	4		9
	University libraries	5		7	3		7	6		8	2		4
	Other	2		3	2		5	5		7	2		4
Where is the link?	Upper (Left, Center, Right)	24	68	35	21	43	49	20	73	27	24	45	53
	Center (Left, Center, Right)	20		29	6		14	27		37	5		11
	Lower (Left, Center, Right)	24		35	15		37	26		36	16		36

comparisons remain valid. This study of medium-sized universities found that 91 percent of the universities had a link to the library (table 4). Studies by Agingu and King found similar percentages of those universities with links. In her examination of sixty-five Web sites of traditionally black colleges and other institutions in the southeastern U.S., Agingu reported that 97 percent had a link to the library home page. Ninety-three percent of the 111 ARL universities in King's study had a link.[21] Thus, the type of university surveyed seems to have little effect on the presence of a link to the library on the university home page. Studies that included ARL universities have reported 93 percent, 80 percent, and 76 percent having links to the library. These differences may be due in part to the way each link was counted. For example, in some studies, the criteria for counting a link were that it should be "obvious" in order to be counted as a link. Medium-sized universities also differed, with 91 percent, 71 percent, and 67 percent having links. Examining the data chronologically also shows no clear pattern of increasing or decreasing links. Earlier studies from 1996 and 1998 had good library representation (85 or 93 percent, respectively); while a study from 1999 had much lower library representation (58 percent). Three studies from 2000 and 2001 found links to the library on the home page from 68 to 97 percent of the time. When this study is compared with other 2005 studies, the library is on the university home page from 71 to 91 percent of the time.

User groups library link

Due to daily work and study needs, internal user groups were expected to have a link to the library more often than external user groups. Internal user groups showed a high

Table 3. External user groups: prospective students, alumni and donors, parents and family, visitors, and community

		Prospective students 1st occur *N*=61			**Alumni & donors 1st occur *N*=73**			**Parents & family 1st occur *N*=36**			**Visitors & community 1st occur *N*=38**		
Question	**Responses**	**set *n*=**	**Total *N*=**	**%**	**set *n*=**	**Total *N*=**	**%**	**set *n*=**	**Total *N*=**	**%**	**set *n*=**	**Total *N*=**	**%**
Is there a link to the library?	Yes	45	*61*	74	36	73	49	24	36	67	23	38	60
	No	16		26	37		51	12		33	15		40
How many links are there to the library?	1	34	45	76	26	36	72	17	24	71	17	23	74
	2	11		24	10		28	7		29	6		26
What term is used for the library link?	Libraries or Library	28	45	62	26	36	72	13	24	54	16	23	70
	Library or Libraries & "other"	4		9	4		11	2		8	5		22
	Library name	11		24	4		11	6		25	1		4
	University libraries	2		4	2		6	3		12	1		4
	Other	0		0	0		0	0		0	0		0
Where is the link?	Upper (Left, Center, Right)	22	45	49	23	36	64	10	24	42	14	23	61
	Center (Left, Center, Right)	10		22	4		11	5		21	3		13
	Lower (Left, Center, Right)	13		29	9		25	9		37	6		26

percentage of links to the library (Faculty and Staff: 94 percent; Students: 97 percent). External users had link-to-the-library frequencies ranging from 49 percent (Alumni and Donors) to 74 percent (Prospective Students). There was significant variation among the groups in the presence or absence of at least a single library link (X^2=20.29, d.f.=6, p<0.005); significantly more internal user group pages than external user group pages had at least one link to the library (X^2=19.48, d.f.=1, p<0.005).

In addition to the presence of a single link, internal user groups were also expected to have more additional links to the library. Additional links may appear due to follow-through menus or the deliberate addition of links because of perceived importance of these services by administrators or Web designers. In addition to the appearance of the first link, 50 percent of the Faculty and Staff and Students user groups had more than one link to the library. Internal pages had significantly more library links per page than external pages (t=8.6, d.f.=1, p<0.05).

Because of these results, comparison of the number of links on the university home page to those on internal and external user group pages was not surprising. There was no significant difference between the number of library links on university home pages and the number of links on internal user pages (p>0.05). However, there was a significant difference between the number of library links on university home pages compared to the number of library links on external user home pages (t=7.2, d.f.=1, p<0.05).

User groups: external

Little academic literature was available on college and university Web sites from the non-librarian perspective.[22] More quantitative approaches to university Web sites include literature on informetric studies. For example, a recent link metrics study examined the number and type of links on the university Web page in relation to the research at that university.[23] Internal users (Current students, Faculty and Staff) and one group of external users (Prospective students) were examined in the available research. No academic literature was available for any of the other external user groups.

In articles on prospective students and the university Web site, the library was not recommended or even mentioned as being an attribute to include on the Prospective Students Web page. In a study of fifty-five prospective students, participants were asked their opinions on content and design of the university Web site. Prospective students were most interested in information on admissions and environmental content, such as physical appearance of the campus itself, fellow students, and activities available. Poock and Lefond presented a table with the information that these prospective students expect to see when visiting a university Web site.[24] Fifty-nine answers included a variety of topics, such as information on admissions, athletics, course offerings, job opportunities, on-campus housing, majors and minors available, student social life, quick university facts, campus news and calendar, school colors, nickname and fight song, and campus location. The library was conspicuously absent from this list.

In an article about the use of search engines in a university's recruitment strategy, Whiteside and Mentz advocated the use of key departments and keywords that highlight benefits and successes that would attract students to attend the university.[25] They provided a partial list of suggested departments and terms to include for prospective students. Their list includes information on thirty items, such as accreditation, national rankings, admissions requirements, financial aid, enrollment size,

Table 4. University home page links to the library

Article author	Publication year	Institution type	*N*=	% with link
Agingu	2000	SE Black univ. & other inst.	65	97
Astroff	2001	ARL	111	76
Dewey	1999	Cmte on Institutional Cooperation	12	58
Harpel-Burke	2005	Med-sized univ (8–13K students)	77	91
King	1998	ARL	111	93
Stover & Zink*	1996	General higher education	40	85
Tolppanen, et. al	2000	Med-sized univ (6–13K students)	133	68
Tolppanen, et. al	2005	Med-sized univ (6–13K students)	133	71
Welch	2005	ARL & non-ARL	106	80

*Inverse; reports links from the library home page to the university home page

wireless capability, disability services, extracurricular activities, degree programs, advisement, athletics (and the name of the sport), housing, directions for visiting, and safety issues. Library resources and facilities were absent from this list as well.

User groups: internal

In these discussions of topics that Web-savvy prospective students look for on university Web pages, libraries may have been overlooked without good reason. In fact, Mechitov, Moshkovich, and Underwood performed an analysis of "student perceptions of academic Web sites and to determine the principal criteria that students use in forming positive and negative perceptions" for internal user groups.[26] Students evaluated aspects of the Web sites for attractiveness, information content, and entertainment. The evaluation indicated that ease of access to information and certain stylistic design issues (i.e., color coordination) were most important to the students. Analysis revealed that one of the four main reasons for visiting and revisiting university Web sites was for "additional information (e.g., on-line *library* and bookstore, research pages, writing center, job links and employment, search engines for student e-mail addresses)." Thus, the authors recommended that an effective university Web site should feature separate Web pages for all university services "(housing availability and policies, including photos of all dormitories, dining room services, *libraries*, career centers, bookstores, athletics)."[27] Therefore, it seems that links to the library should probably have been included regularly in user pages for prospective students.

The literature on faculty perceptions also included the library. Abels, White, and Hahn used focus groups and questionnaires to gather data from business faculty with Internet experience. An important component of the study was to "identify the criteria that users consider in using a Web site."[28] The researchers were interested in describing the faculty's information needs, search behaviors, and their Internet and Web use. Although the library was not specifically mentioned, most of the faculty indicated that locating literature was their greatest reason for using a Web site. This literature was described as "scholarly articles in business or professional journals."[29] Specifically, the resources that they focused on (electronic databases and full-text versions of these journals) are commonly available on the university library's Web site.

Thus, absence or presence of a link may be attributed to the universities' "dual roles of being public institutions while simultaneously having to act competitively and efficiently."[30] The university Web site's promotional functions suggest that a link to the library for recruitment purposes is not essential. However, further study in this area is warranted to determine if the presence or absence of a library link for external users has any impact on recruitment, donations, or community relations. For internal users, the importance of a link to the library was clearly recognized. Not addressed here is the issue of internal users who fail to recognize the Web site as a resource for fulfilling their information needs.

Terminology

In general, links to the library were labeled with the word Library or a phrase containing the word. Terminology was fairly uniform throughout all user groups and on the home page. In only a few cases were any other terms used to identify the library, such as Reference Desk for Faculty and Staff. Because the terminology used was not varied, no statistical analyses were performed. In general Web design principles, clever phrases and jargon are discouraged; informative and unambiguous terms are recommended. Nielsen noted that vague terminology causes users to puzzle over meanings and may serve to alienate them.[31] Use of easily understood terms also makes sense from a recruitment or marketing standpoint. Whiteside and Mentz note that in order to highlight the benefits derived from attending a particular institution, "colleges and universities must target the search engine terms . . . or keywords that Internet users are likely to use."[32]

Library link placement

Web site usability research indicates that the most sought-after information should be located in the upper part of the page in either of the top corners.[33] Findings in the Poynter Institute's Eyetracking III study, which examined how Internet users read newspapers online, also indicated that eyes tend to gravitate to the upper left corner of a Web page.[34] Because it is unclear if the library is the most sought-after information, there were no expectations associated with the placement of the library link.

Spatial placement of the first library link on the university home page and subsequent user groups was quite varied. On the home page, the first link to the library was mainly in the center of the page (47 percent). However, the upper right corner was also used often (21 percent).

For the user group pages, the internal user group pages were fairly evenly divided among the upper, center, and lower part of the page. Faculty and Staff user groups had the most links divided between the upper (35 percent) and lower part of the page (35 percent), with 29 percent in the center of the page. Student user groups had most links in the center (37 percent) and lower parts (36 percent) of the page, with 27 percent in the upper part of the page.

All of the external groups had the most links to the library in the upper part of the page. Alumni and Donors placed the link there 64 percent of the time, followed by

Visitors and Community (61 percent), Prospective students (49 percent) and Parents and Family (42 percent). There is significant variation in link placement among the user groups (X^2=34.20, d.f.=12, p<0.005).

Thus, relatively few university pages placed the link to the library in the area recommended for high-profile links. Links for internal users also had no consistently dominant position. However, links to the library for external user group pages were most often in the upper portion.

Conclusion

With 91 percent of the medium-sized universities in this study having links to the library on their home page, library representation on university home pages is quite good for the general user. Similarly, library representation on both types of internal user group pages—Faculty and Staff and Current Students—was also very high. Although a link to the library does not necessarily indicate the value that the university places on the library, these high percentages suggest that the library is important to the people responsible for university Web pages. Although library representation on external user group pages was lower (both in number of library links and prominence of those links), these groups still had a substantial number of library links.

General studies on the importance and promotion of the library to these user groups would seem valuable in determining the need, availability, and placement of links for these groups. Usability studies exploring the ways that these external user groups make use of the library via the Web site may also have many potential benefits.

Individual library Web pages targeted to a specific user group could be specially designed to showcase services for that group.

As noted by Jafari, "[m]ixing the information categories needed by both current and prospective members on a single Web site results in a compound design solution that does not serve either group well."[35] This concept could be further developed for the library Web page; each of the separate user groups could find the information about the library that they value most.

For example, prospective students and their parents may appreciate pages that would give them information that they can use in making a university choice. For these two external user groups, library pages could be designed that highlight information on collection age and size, electronic resources, assistance by library staff, and special programs such as laptop borrowing.

A library Web page designed for donors could also emphasize various services that could encourage financial support. These pages could give guidance on gifts of various amounts by suggesting specific books (with donor plates) or perhaps showcasing previous larger donations that resulted in a building, room, or a collection named in honor of the donor.

By contrast, internal user groups are more interested in Web pages that highlight specific services associated with their daily activities. Current faculty and staff may want to make suggestions for acquisitions, or place interlibrary loans. Current students may visit the library Web page to use databases, check the availability of study areas, or locate spots for wireless connections. Kvarik and Handberg studied the changes in student services in general.[36] They noted that students are now determining the flow, timing, and format of information that they need. For students, the library Web page could emphasize 24/7 access to the library, electronic formats, and remote access to databases.

Thus, further study on the overall importance of the link to the library for these various user groups is warranted. Specific content of internal and external user group pages also merits further investigation. Then the feasibility and necessity of individual Web pages or portals to the library for each user group could be considered.

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