The Physical and the Virtual: The Relationship between Library as Place and Electronic Collections

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A statistical analysis of responses to a LibQUAL+™ survey at the University of Colorado at Boulder (UCB) was conducted to investigate factors related to patrons' satisfaction with electronic collections. It was found that a respondent's discipline was not related to his or her satisfaction with the Libraries' electronic collection, nor was the frequency with which the respondent used the Libraries' facilities or used commercial search engines. The factors significantly related to users' satisfaction with electronic collections were the frequency with which they used the Libraries' Web site, and, most interestingly, the physical library they most often visited.

The University Libraries at UCB in recent years began to spend a majority of the materials budget on electronic, as opposed to print, resources (over 56% in Fiscal Year 2007–2008). Reallocating monies in this manner appears to be in concert with patrons' desires.[1] And although both UCB and the Association of Research Libraries' (ARL) LibQUAL+™ results do indicate that patrons' satisfaction with electronic resources is more than adequate, it is always necessary to seek to improve upon services that garner such a share of a library's resources. In fact, satisfying patrons' desires for electronic information may be the modern research library's primary concern and challenge.

Therefore, the authors decided to determine from 2006 LibQUAL+™ results what factors are related to patrons' satisfaction with electronic information resources. Do perceptions change as patrons use the Libraries more frequently? Is their perception of the UCB Libraries' Web site related to their perception of the electronic collection? To what extent is their use of commercial search engines, their discipline, or the facility they use most often involved? This study seeks to answer these questions so that libraries may find appropriate investment avenues for improving patrons' perceptions of electronic collections. It may not always be enough to simply purchase more databases. While this study will not specifically address budget allocations, the findings suggest that other investments, such as those in personnel, discovery tools, Web site design, or facilities may reap additional returns in this regard.

Methodology
UCB participated in its fourth LibQUAL+™

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survey in 2006 and plans on participating in its fifth in 2009. For the purposes of this study, there were 520 usable responses to the 2006 survey. Using Thompson's suggestions for determining the reliability and validity of LibQUAL+™ results, these 520 responses appear to be both reliable and valid (see Appendices A and B for item and factor analysis tables).[2] The responses do, perhaps, overrepresent faculty and graduate students, and this should be borne in mind when results are interpreted (see Appendix C).

LibQUAL+™ provides respondents 22 core statements divided into three dimensions: Library as Place (LP), Information Control (IC), and Affect of Service (AS). LP statements pertain to physical library facilities and equipment, IC to collections, both print and electronic, and AS to levels of staff service. For each of the 22 statements, a respondent ranks the library on a scale of 1–9 three times: once to indicate their desired, or optimal, level of service; once to indicate their minimum, or adequate, level of service; and finally, the respondent rates how he or she perceives the library relative to his or her minimum and desired expectations.

The authors considered all questions related to collections from the LibQUAL+™ instrument to use as a measure of patrons' satisfaction with UCB's electronic collection. Of the 22 core questions in LibQUAL+™, the statement IC-4, "The electronic information resources I need," appeared to be most directly associated with a patron's perception of an electronic collection. It was also decided that, of the three responses given to IC-4 and every other measure in LibQUAL+™, the perceived score would be used, as it has been shown to be the most predictive of overall patron satisfaction.[3]

This perceived score of IC-4 being the dependent variable, five independent variables were chosen to determine their relationship to IC-4. Of those five, three were "library use" questions (four answers to these questions are possible: daily, weekly, monthly, quarterly, or never): 1) "How often do you use resources on library premises?"; 2) "How often do you access library resources through a library Web page?"; and finally, 3) "How often do you use Yahoo™, Google™, or nonlibrary gateways for information?" The library premises question was used to determine if a patron's familiarity with library facilities correlated with his or her satisfaction with electronic collections. The authors chose the library Web page question to determine if the more frequent use of these Web sites results in satisfaction with electronic collections. Finally, it was hypothesized that, because only a fraction of UCB's electronic collection is accessible through nonlibrary gateways, frequent use of them may be negatively correlated with a patron's satisfaction with electronic collections. In addition to these use questions, an independent variable of the respondents' age was also considered.

Two additional independent variables were chosen for this study. The first was patron discipline, and the second was responses to the question "What library do you use most often?" This variable was expected to be similar to that of discipline since the five branches (Business, Earth Sciences, Engineering, Math/Physics, and Music) are disciplinary branches. Library choice was disaggregated into users who frequent Norlin Library, UCB's flagship facility in the center of campus, and users who frequent one of UCB's branches: Business, Earth Science, Math-Physics, Music, or Engineering.

Results

The library use and age questions were analyzed using Pearson Correlations because the dependent and independent variables are scale. The discipline and library as place questions were compared to IC-4 using an independent t-test because the independent variables are ordinal and the dependent is scale. These tests were both used to determine if there is significant correlation between the dependent and independent variables. A

TABLE 1
Pearson Correlations of Use and Age Data to Perception of Electronic Resources

Variable		IC4—The electronic information resources I need
Age	Pearson Correlation	.001
	Sig. (2-tailed)	.988
	N	516
How often do you use resources on library premises?	Pearson Correlation	−.001
	Sig. (2-tailed)	.986
	N	516
How often do you access library resources through a library Web page?	Pearson Correlation	−.112*
	Sig. (2-tailed)	.011
	N	516
How often do you use Yahoo™, Google™, or nonlibrary gateways for information?	Pearson Correlation	−.006
	Sig. (2-tailed)	.887
	N	516
*Correlation is significant at the 0.05 level (2-tailed).		

more in-depth investigation of the results follows in the discussion section.

Library Use Questions

Of the three use questions, as well as the respondents' age, only one was significantly correlated to satisfaction with electronic collections: the frequency with which the respondent uses the Libraries' Web site to access electronic information, which was correlated at −.112 (see table 1). Responses to these LibQUAL+™ usage questions decrease in number as use increases: 1=daily use; 2=weekly use; 3=monthly use; 4=quarterly use; 5=never.

This means that, although the Pearson Correlation between IC-4 and use of the Libraries' Web site is negative, the relationship is actually positive—the more frequently the Web site is used, the higher the respondent answers IC-4.

Science, Social Science, and Humanities: Electronic Perception Analysis

An independent t-test demonstrated no significant correlation between discipline and perceptions of the electronic collection. The means, for each discipline, 6.91 for Social Scientists, 6.74 for Humanists, and 6.97 for Scientists demonstrates that the means also had a small difference across the disciplines. Apparently, differences in research methods based on discipline did not affect the perceptions of the electronic resources collection, a somewhat unexpected result (see table 2).

TABLE 2					
Significant Differences of Perception of Electronic Resources among Broad Disciplines					
Discipline	N	Mean	Std. Deviation	T	Sig. (2-tailed) to IC4
Social Scientists	146	6.91	1.490	−0.427	.669
Humanists	144	6.74	1.626	1.165	.244
Scientists	187	6.97	1.550	−1.200	.231

Library as Place

The six buildings of University Libraries at the University of Colorado at Boulder are anchored by Norlin Library, a structure originally completed in 1939 that underwent major additions in 1952, 1962, and 1972 and now contains approximately 210,000 assignable square feet. In 2008, renovation began on a 15,050-square-foot Learning Commons and a 17,000-square-foot Research floor.[4] Much of the design of the renovation is based on previous LibQUAL+™ results from 2001, 2002, and 2004, which indicated that students and faculty who use Norlin frequently wanted more study space and computing equipment.

The five branches of the University Libraries vary in age and size but are generally newer facilities and provide more study space and newer furnishings than Norlin. Because of this discrepancy between Norlin and the branches, the authors decided to disaggregate respondents into Norlin and branch users to determine if perceptions of place were correlated to perceptions of electronic collections. Users of all facilities, of course, have access to the same electronic resources, but an independent t-test demonstrated a statistically significant difference between how Norlin and branch users perceive the quality of these resources (see table 3). This table also demonstrates that Norlin users had a lower mean perception of electronic resources (6.78 versus 7.08 for branches).

This result is probably the most important and surprising result of the study: a user's perception of a library as a physical facility seems to have influence on his or her perception of the library's electronic collection.

Because some branch/discipline categories only had 1 or 2 responses (see table 4), a correlation specifically on the disciplines using each branch would not provide an accurate representation of how the disciplines viewed the branches and Norlin differently. While this table demonstrates that there are users who are visiting branches that do not necessarily correlate to their disciplines, the majority of users are visiting branches associated with their departments. Therefore, the authors ran correlations on the broad disciplinary categories (sciences, social sciences, and humanities) on Norlin and branches. No significant correlation was found between discipline and the branch used, which is similar to the results discovered in the earlier section of this article.

Discussion

Library Use

The only library use or demographic question that was significantly correlated to IC-4 was the frequency with which a patron used the library Web site. Library Web sites operate as the virtual face of the library, for both print and electronic resources, but access to electronic library resources is primarily through the library Web site. While in some cases the difference between libraries' "Web pages" and "catalog" are important, it can be assumed, for the purposes of this survey, that "a library Web page" includes both the Web site and catalog.

The correlation between the use of the Web site and the perception of the electronic collections suggests that the Web site facilitates the discovery of electronic resources. The Web site is the most comprehensive discovery tool for electronic collections in the library. While students' perceptions of the library Web site were satisfactory

TABLE 3					
Statistical Difference in Perception of Electronic Resources Between Norlin and Branch Users					
Library Used	**N**	**Mean**	**Std. Deviation**	**t**	**Sig. (2-tailed) to IC4**
Norlin	372	6.78	1.587	1.995	.047*
Branch	144	7.08	1.456		
*Correlation is significant at the 0.05 level (2-tailed).					

TABLE 4					
Discipline and Library Used					
Discipline	**Norlin**	**Earth Sciences & Maps**	**Music**	**Engineering**	**Business**	**Math / Physics**
Agriculture / Environmental Studies	1	1	0	0	0	0
Architecture	12	1	0	0	0	0
Business	5	0	0	0	15	0
Communications / Journalism	20	0	0	0	0	0
Education	11	1	0	0	0	0
Engineering / Computer Science	18	1	0	41	0	5
General Studies	1	0	0	0	0	0
Health Sciences	14	0	0	0	0	0
Humanities	110	1	0	0	0	1
Law	5	0	0	0	2	1
Other	30	1	0	0	0	1
Performing & Fine Arts	9	0	24	0	0	0
Science / Math	60	11	0	1	0	36
Social Sciences / Psychology	76	0	0	0	0	0
Undecided	3	0	0	0	0	0
Military / Naval Science	1	0	0	0	0	0

(perceived score of 6.90 on a 9-point scale), it is important in this constantly changing electronic environment to continually evaluate and improve access to e-resources.

Therefore, the Libraries have initiated a series of improvements to the mechanisms that enable discovery of electronic collections. At the time of the LibQUAL+™ survey under analysis, finding an electronic article sometimes required checking two different interfaces. To address this problem, the Libraries have started to load *Serials Solutions* records into the catalog with coverage loads for all the subscription databases.

A second improvement was to implement an open-URL resolver technology branded "Find it at CU" that examines those coverage loads and links the database information to resources available, either in print or electronically in another database. The Libraries also implemented an electronic records management program that allowed the development of a more robust and clear interface to the databases available at CU-Boulder. The Libraries have also hired a consultant to assist in the redesign of the Libraries' main Web page.

Discipline
While the correlation between usage of the Web site and satisfaction with electronic resources came as no surprise, the

lack of correlation between discipline and perceptions of electronic resources did. There are clear indicators in other studies that discipline does have an effect on how patrons use electronic library resources.[5] There are a number of possible theories for this lack of correlation.

The most promising explanation is that the Libraries have been managing their electronic resource budget well. The various subject bibliographers have bought the right electronic collections for their patrons, and there are no significant differences in how various disciplines perceive the resources. That they are purchasing print where print is desired and electronic where it is desired is a possible explanation for this lack of significant difference in satisfaction.

Another possibility that warrants further study using additional sources of data covering longer periods of time is that the differences between disciplines in the print world do not carry over to electronic resources, that differences in scholarly communication narrow as the electronic format becomes the norm. More understanding of information needs and information-seeking behaviors among the disciplines need to be gathered before such a statement could be proven.

While this area did not draw concern as the other areas did, the UCB Libraries have continued to address the needs of patrons when it comes to electronic resources. Disciplines such as computer science have seen a need for current and searchable electronic books and have switched to purchasing material in the electronic arena. The UCB Libraries have continued to expand access across disciplines to back files of serial publications. While some disciplines still prefer the book to be on the shelves, with respect to serials more and more interest has been seen in switching to additional access online.

There are six libraries at UCB, five of which—the "branches"—focus on particular disciplines. While the broad disciplines for the branches versus Norlin users did not correlate to perceptions of electronic resources, this does not necessarily mean there is not a possible correlation between facility and perceptions of collections. It is possible that branches have higher satisfaction ratings because they are embedded with their patrons. The patrons go to class across the hall from the library or even in the library itself. The librarian can be a constant presence in their academic careers. While this LibQUAL+™ set was not large enough or detailed enough to demonstrate a correlation based on the individual disciplines served by the branches, this is an area that warrants further study. It is possible that more than chairs, study space, and recent remodels affect a user's perception of resources in a particular place.

Library as Place

The most important discovery of this study was that there was a significant correlation between the patron's perception of the electronic resources available to them and the library he or she most frequently used. Newer facilities with more study space, regardless of a patron's age, discipline, or frequency of use, were significantly related to patron perceptions of e-resources. Why a user's experience in a facility is tied to his or her experience of its virtual presence is a matter of great interest and certainly requires more study.

But libraries are not alone in recognizing this phenomenon. Recent research in business and marketing communities suggests that there is a strong tie between online and physical sales patterns. For instance, Browne et. al. found that companies' Web sites can drive sales in physical locations.[6] Known as "multi-channel" marketing or retailing, where online and physical retail presences act as individual "channels," it has also been shown that a user's consistency of experience between these channels is an important predictor of his or her satisfaction. In an empirical study of nearly 600 consumers, it was

found that

> [there] is the need for customers to have a consistent experience across all of the channels that they use in communicating with the supplier. Indeed, such is the importance of 'consistency of experience' that determining how it can be achieved must become a priority for multi-channel marketers. Our findings also have implications for market researchers, suggesting that cross-channel experience consistency and perceived channel choice need to be tracked as thoroughly as many organisations already track satisfaction levels with individual channels. Market researchers, like market strategists, need to build bridges between channel silos.[7]

An inconsistency across these channels (a satisfactory Web site but a displeasing building, or the reverse) can lead to diminished levels of overall customer satisfaction.

The results of this study corroborate such findings. Though overall satisfaction levels of UCB users with the electronic "channel" of library services remain quite high, at least as measured by LibQUAL+™ and as compared against ARL averages, the consistency of experience of Norlin users does not seem to be as positive as that of UCB branch library users. Mean ratings that branch users gave electronic collections were 3 percent higher than those of Norlin users; they also gave "Library as Place" perceived means that were 8 percent higher than Norlin users. Again, these were statistically significant results that indicate an inconsistency of experience.

This correlation gives serious pause to predictions of the demise of the physical library, as succinctly stated by Charles Martell:

> The construction of new libraries will diminish, and within twenty-five years the physical symbol of the library will no longer be a viable representation of functionality.[8]

Just as physical retailing has not met its demise, it is possible that the physical library will continue to play a vital role on the campuses of colleges and universities throughout the world, simply because in the user's mind these facilities are not divorced from the electronic resources they provide. They may transform their use of assignable square feet, but the need for facilities that bring people and information together may survive, and users' perceptions of those facilities could influence their perception of the virtual extensions of those facilities.

To improve Norlin users' perceptions of electronic collections, then, there is more UCB can do than simply purchasing more online indexes, e-books, and electronic journal subscriptions and back files. They can invest in Norlin as a physical space and improve the consistency of its users' experiences. And indeed, they are already doing so. The remodel of the "Research Floor" included consultation rooms and brought together staff that had been scattered all over the library, which follows more closely the branch model. It also provided students with access to the librarians in their disciplines in a dedicated place rather than requiring them to discover where the librarian for their discipline is hidden. These remodels will hopefully result in a loss of correlation between the perceptions of the electronic collection between branch and Norlin users.

While this remodeling of the library is a good first step, it is but the first phase of a five-phase "Norlin Renaissance" plan that intends to return the building to the state that inspired the University's motto: "Let your light shine." This motto was inspired by a 3-story convex glass wall that once lit the center of campus but has since been covered by successive expansion projects. Should the campus decide to invest in this opportunity, there is reason to believe the return will not be limited to increased

satisfaction with Norlin itself, but with all library services, both physical and virtual.

Future of the Physical and Electronic Library

This finding that the user's experience in a physical library is correlated to his or her perception of that library's electronic collection suggests that a successful investment strategy is one of integration, rather than disintegration, of print and electronic resources, services, and facilities in college and research libraries. Libraries still need books, and they also need to provide the space, expertise, equipment, and Web-based tools to discover the electronic resources. If user perceptions reveal an integrated physical and virtual library, libraries can and should respond with integrated investments, attention, and noncapital resources.

Recent literature on the future of "library as place" corroborates this thesis of integration. Some studies support the notion that physical facilities must evolve from the model of a warehouse of books to an area of technology and congregation.[9] Literature on this "information commons" model of library facilities abounds.[10] And the model appears to be successful: Shill and Tonner found, in fact, that 80 percent of libraries that underwent major new construction or renovation projects between 1995 and 2002, and converted space specifically to provide more dataports, public computers, seats with wireless access, improved telecommunication services, natural lighting, and user work spaces (among other variables) increased use of their facilities at a median rate of over 37 percent.[11]

This study suggests that future research on the "library as place" and the "digital library" include investigations on how they affect each other. College and research libraries can no longer conceive of their physical and virtual services as silos that users experience independently. They must understand that walk-in traffic statistics include in many cases the same individuals who are represented as "page views" on their Web sites and "downloads" in their e-resource data. Users visit the library virtually and physically, and research librarians must develop an understanding of not only how and why they use libraries in these different channels but how use in one affects perceptions of another. The correlation in this study is only a tentative beginning to this understanding.

Conclusion

At UCB, LibQUAL+™ results have shown, as expected, a correlation between use of the library Web site and perceptions of the e-resources collection. Interestingly, the correlation between discipline and e-resources perceptions is not significant. This difference could be explained by intelligent purchasing by the University Libraries or could signal a shift in use and expectations of e-resources by discipline.

But, most significantly, a correlation between place and e-resources was demonstrated. This correlation demonstrates the possibility that, despite a shift to more electronic usage of library resources, physical space is still an important factor in perceptions of resources. Investing in aesthetically pleasing facilities with ample study space and customized services could yield as much return in satisfied patrons as investing in electronic materials.

This study of one institution, in one year, can only be a start to this discussion. As libraries struggle to determine their place and future in a more electronic age, these data demonstrate, for UCB at least, that the physical component of the library must remain an integral part of the discussion.

APPENDIX A Item Analysis Table (n=520)		
	Corrected Item— Total Correlation	Cornbach's Alpha if Item Deleted
AS01 Employees instill confidence in users	.697	.952
AS04 Giving users individual attention	.673	.953
AS06 Employees are consistently courteous	.657	.953
AS09 Readiness to respond to users' questions	.772	.952
AS11 Employees have knowledge to answer users' questions	.744	.952
AS13 Employees deal with users in a caring fashion	.748	.952
AS15 Employees understand the needs of their users	.790	.951
AS18 Willingness to help users	.792	.951
AS22 Dependability handling users' service problems	.757	.952
IC02 Making electronic resources accessible to home or office	.562	.954
IC05 Library Web site enabling me to locate info on my own	.573	.954
IC07 Printed library materials I need for work (perceived)	.644	.953
IC04 Electronic info resources I need (perceived)	.701	.952
IC14 Modern equipment lets me easily access needed info	.723	.952
IC16 Easy access tools allow me to find things on my own	.718	.952
IC19 Making info easily accessible for independent use	.737	.952
IC20 Printed and/or electronic journal collection required for work	.622	.953
LP03 Library space that inspires study and learning	.593	.954
LP08 Quiet space for individual activities	.686	.953
LP12 A comfortable and inviting location	.652	.953
LP17 A getaway for study, learning, or research	.681	.953
LP21 Communal space for group learning and group study	.631	.953
Note: Cornbach's alpha for total scores using all 22 items was 0.955.		

APPENDIX B
Factor Analysis Table
Principal Components Rotated to the Varimax Criterion (n = 520)

	Factor		
	1	**2**	**3**
AS01 Employees instill confidence in users	**.765**	.230	.205
AS04 Giving users individual attention	**.726**	.226	.213
AS06 Employees are consistently courteous	**.816**	.116	.202
AS09 Readiness to respond to users' questions	**.736**	.360	.240
AS11 Employees have knowledge to answer users' questions	**.680**	**.410**	.210
AS13 Employees deal with users in a caring fashion	**.818**	.212	.260
AS15 Employees understand the needs of their users	**.777**	.329	.259
AS18 Willingness to help users	**.801**	.341	.222
AS22 Dependability handling users' service problems	**.646**	.370	.314
IC02 Making electronic resources accessible to home or office	.238	**.769**	.032
IC05 Library Web site enabling me to locate info on my own	.277	**.691**	.084
IC07 Printed library materials I need for work (perceived)	.272	**.516**	**.413**
IC04 Elec info resources I need (perceived)	.251	**.788**	.250
IC14 Modern equipment lets me easily access needed info	.278	**.624**	**.434**
IC16 Easy access tools allow me to find things on my own	.369	**.710**	.223
IC19 Making info easily accessible for independent use	.399	**.620**	.319
IC20 Printed and/or electronic journal collection required for work	.140	**.676**	.361
LP03 Library space that inspires study and learning	.210	.103	**.831**
LP08 Quiet space for individual activities	.325	.189	**.767**
LP12 A comfortable and inviting location	.235	.190	**.817**
LP17 A getaway for study, learning, or research	.226	.303	**.759**
LP21 Communal space for group learning and group study	.247	.282	**.669**

Note. "AS" = Affect of Service measure; "IC" = Information Control measure; "LP" = Library as Place measure. Pattern/structure coefficients greater than |0.40| are **bold**.

APPENDIX C Respondents Profile				
User Sub-Group	**Population N**	**Population %**	**Respondents n**	**Respondents %**	**%N–%n**
First year (Undergraduate)	6,729	22.04	12	2.24	19.80
Second year (Undergraduate)	5,284	17.31	45	8.41	8.90
Third year (Undergraduate)	5,718	18.73	30	5.61	13.12
Fourth year (Undergraduate)	5,086	16.66	19	3.55	13.11
Fifth year and above (Undergraduate)	1,278	4.19	20	3.74	0.45
Non-degree (Undergraduate)	506	1.66	0	0.0	1.66
Masters (Graduate)	1,636	5.36	73	13.64	-8.29
Doctoral (Graduate)	2,765	9.06	147	27.48	-18.42
Non-degree or Undecided (Graduate)	113	0.37	3	0.56	-0.19
Adjunct Faculty (Faculty)	0	0.0	6	1.12	-1.12
Assistant Professor (Faculty)	274	0.90	41	7.66	-6.77
Associate Professor (Faculty)	302	0.99	46	8.60	-7.61
Lecturer (Faculty)	377	1.23	9	1.68	-0.45
Professor (Faculty)	464	1.52	54	10.09	-8.57
Other Academic Status (Faculty)	0	0.0	30	5.61	-5.61
Total:	**30,532**	**100.00**	**535**	**100.00%**	**0.00%**

Notes

1. The 2006 LibQUAL+™ at UCB revealed that, on a scale of 1–9, the desired mean level of service for electronic resources was 8.33 and 7.86 for print. Many other studies have revealed this preference more generally. The *2006 LibQUAL+™ ARL Notebook*, available at www.libqual.org/documents/admin/ARL_Notebook_2006.pdf, shows user preference for electronic formats over print, for instance; and in a summary of hundreds of research projects as early as 2003, it was noted that "[a]lmost all types of users perceive many advantages of electronic journals, in particular when electronic journals are convenient for their work." Carol Tenopir, Brenda Hitchcock, and Ashley Pillow, "Use and users of electronic library resources: an overview and analysis of recent research studies," *Council on Library and Information Resources* (Aug. 2003), 42. Available at www.clir.org/pubs/reports/pub120/pub120.pdf. [Accessed 28 July 2008].

2. Bruce Thompson, Martha Kyrillidou, and Colleen Cook, "How You Can Evaluate the Integrity of Your Library Service Quality Assessment Data: Intercontinental LibQUAL+™ Analyses Used as Concrete Heuristic Examples," *Proceedings of the 2006 Library Assessment Conference: Building Effective, Sustainable, Practical Assessment* (Charlottesville, Va., Sept. 25–27, 2006).

3. Michael J. Roszkowski, John S. Baky, David B. Jones, "So, Which Score on LibQUAL+™ Tells Me if Users Are Satisfied?" *Library & Information Science Research* 27 (2005) 424–39.

4. For more information, see http://ucblibraries.colorado.edu/learningcommons/index.htm

5. For example: Donna Gardiner, David McMenemy, and Gobinda Chowdhury (2006), "A Snapshot of Information Use Patterns of Academics in British Universities," *Online Information Review* 30, no. 4 (2006): 341–59; Eileen E. Brady, Sarah K. McCord, and Betty Galbraith (2006), "Print versus Electronic Journal Use in Three Sci/Tech Disciplines: the Cultural Shift in Process," *College & Research Libraries* 67 (July 2006): 354–63; Liu, Ziming, "Print vs. Electronic Resources: A Study of User Perceptions, Preferences, and Use," *Information Processing & Management* 42, no. 2 (Mar. 2006): 583–92; Myka Carroll Del Barrio, "The Same…but Different: Varying User Behavior in the Humanities and Social Sciences," *Against the Grain* 18, no. 1 (Feb. 2006): 59.

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7. R. Madaleno, H. Wilson, and R. Wilson, "Determinants of Customer Satisfaction in a Multi-channel B2B Environment," *Total Quality Management & Business Excellence* 18, no. 8 (2007), 915–25.

8. Charles Martell, "The Disembodied Librarian in the Digital Age, Part II," *College & Research Libraries* (Mar. 2000): 110.

9. J. Pomerantz and G. Marchionini, "The Digital Library as Place," *Journal of Documentation* 63, no. 4 (2007): 505–33.

10. For a concise overview of the information commons model, see M. Spencer, "Evolving a New Model: The Information Commons," *Reference Services Review* 34, no. 2 (2006): 242–47.

11. H. Shill and S. Tonner, "Does the Building Still Matter? Usage Patterns in New, Expanded, and Renovated Libraries, 1995–2002," *College & Research Libraries* 65, no. 2 (2004): 123–50.