



# Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants



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**Abstract:** This paper identifies approaches, challenges, and best practices related to planning and designing today's academic library learning spaces. As part of the Project Information Literacy (PIL) Practitioner Series, qualitative data is presented from 49 interviews conducted with a sample of academic librarians, architects, and library consultants. These participants were at the forefront of the same 22 recent library learning space projects on college and university campuses in the US and Canada between 2011 and 2016. Most library projects had allocated space for supporting at least one of these four types of academic learning activities: collaborative, individual study, tutoring by campus learning partners, or occasional classes taught by campus instructors. Successful collaboration between the architect and the librarian was fostered by their shared commitment to meeting users' needs, though few stakeholders systematically collected input from users beyond standard usage statistics and gate counts. Most interviewees reported facing some common challenges during their project planning and implementations. One challenge was translating design goals into tangible designs while trying to resolve issues of noise mitigation, shared space allocations, and providing enough electrical power for IT devices. Another challenge was ensuring effective communication practices with planning teams as well as campus-wide constituents throughout projects. Additional challenges included building consensus, compensating for project interruption and inadequate knowledge about both architecture and library IT issues, and having too few a priori evaluation metrics for linking learning outcomes to goals of the library space projects. Taken together, the success of library learning space projects depends upon shared knowledge and understanding of the sweeping learning, pedagogical, and research changes facing the academy. Librarians and architects need to work together to apply that knowledge and understanding to the unique environment and learning and teaching needs of their specific institution.

## Introduction

For the past two decades, academic libraries have been dramatically reinventing their physical spaces. The traditional model of cavernous reading rooms and dark warrens separated by stacks of books is incompatible with the digital age.<sup>1</sup> The library of today and tomorrow must provide versatile spaces that support a wide range of users' learning and research activities while accommodating rapid advances in information technology (IT).<sup>2</sup>

As expectations for library resources and physical facilities have changed, stakeholders have been called upon to transform campus libraries in innovative ways. Most find themselves asking the same crucial question:

*What are the best practices for planning and designing learning-centered libraries that function well today, and are adaptable to future needs as technology opens new avenues for learning, researching, teaching, and working?*

No one spends more time grappling with this complex question than the librarians and architects who are responsible for library learning space projects. To obtain and compile useful solutions and best practices from these stakeholders, Project Information Literacy (PIL) conducted a qualitative study of the collective efforts from 22 academic library learning space projects on US and Canadian campuses between 2011 and 2016.<sup>3</sup>

We interviewed a sample of 49 stakeholders — librarians, architects, and externally hired library consultants — and asked the following questions about planning and designing learning-centered library spaces:<sup>4</sup>

**What best – and worst – practices have librarians and architects learned from the projects that have been the focus of our study?**

- What types of academic learning activities are new spaces intended to support, and how are these designs for learning achieved?
- How do the professional values of librarianship and architecture combine to inform space designs, and what challenges exist when planning and such designs?
- What best — and worst — practices have librarians and architects learned from the projects that have been the focus of our study?

The result is this report, the first in a new research initiative at PIL called “The Practitioner Series.” Our purpose is to share expertise about how academic libraries are addressing users' information, research, and learning needs. Our goal is to explore current educational theory and practice with respect to learning spaces, so readers can make informed decisions about, and investments in, library facilities of their own.

Looking forward, our plan is to conduct a PIL study that will extend and build on findings from this report. Specifically, we will investigate the ways in which the ever-changing student population meets their learning needs within academic libraries and other learning spaces, both physical and virtual.

In the pages of this Practitioner Series report, we provide an executive summary, detailed findings, actionable conclusions, and a summary of best and worst practices. Given the limited size of the institutional sample and the qualitative research methodology used, the findings in this report should not be viewed as comprehensive and generalizable to library learning space projects on every campus. Instead, the findings should be considered exploratory but significant to the literature that examines libraries as places of learning. ❖

<sup>1</sup> S. Bennett (2009). Libraries and learning: A history of paradigm change. *Portal: Libraries and the Academy*, 9(2), 181-197.

<sup>2</sup> B. B. Sinclair (2007). Commons 2.0: Library spaces designed for collaborative learning. *EDUCAUSE Quarterly*, 4, 4-6.

<sup>3</sup> Communication about this report should be sent to Project Information Literacy's (PIL's) Executive Director, Dr. Alison J. Head, at [alison@projectinfolit.org](mailto:alison@projectinfolit.org). This report should be cited as follows: Head, A. J. (2016 December). Planning and designing academic library learning spaces: Expert perspectives of architects, librarians, and library consultants. Santa Rosa, CA: Project Information Literacy, Practitioner Series research report.

<sup>4</sup> PIL Research Team members who conducted telephone interviews and contributed to qualitative data analysis are as follows: Kirsten Hostetler, Associate Director of this study (Central Oregon Community College), and team researchers Alaina C. Bull (University of Washington), Erica DeFrain (University of Nebraska-Lincoln), and Michele Van Hoeck (California State University Maritime Academy).

## Executive Summary

After surviving widespread threats of obsolescence in the early days of the digital revolution, academic libraries continue to face major challenges.<sup>5</sup> What is at stake for nearly every campus library today is transforming the longstanding model of housing collections into a thriving and open-ended learning hub that brings together information, engagement, and technology. For most librarians, the ideal is meeting the physical and virtual learning, research, and teaching needs of an entire campus today and for years to come.

It is no coincidence that these critical revitalization efforts have aligned with dramatic changes throughout higher education. These drivers range from ubiquitous computing to rising operating costs to declining budgets. Pedagogy is undergoing upheaval, too. On many campuses, teaching is more collaborative, interactive, online or blended, and student learning is becoming deliberately more co-curricular.<sup>6, 7</sup>

At the same time, from one campus to the next, students are vastly diverse and changing more quickly and more substantially than the generations that preceded them. Together, they vary greatly in terms of age, ethnicity, experiences, and preferences for face-to-face vs. distance education.

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In this shifting and complex landscape, the role of academic libraries is not fully known. For many librarians and architects who are creating physical and virtual learning spaces in libraries, the million-dollar design question remains: “Is there a model that can stand the test of time as effectively as a centralized print collection has done for hundreds of years, so that libraries remain useful to students and faculty into the future?”<sup>8</sup>

Findings from our Project Information Literacy (PIL) study and interviews with 49 stakeholders — librarians, architects, and library consultants — yielded important insights for readers wanting to know what these experts say are best practices for planning and designing library learning spaces.<sup>9</sup> In this summary, we offer 10 key takeaways from our interviews. These findings are based on discussions about 22 library projects stakeholders collaborated on at community colleges and four-year public and private colleges and universities in the US and Canada between the years of 2011 and 2016.

### Major Findings from the Interviews

1. Architects (77%) and librarians (50%) placed a premium on creating “flexible” spaces in libraries. This meant designing space that was “user-defined,” so users could reconfigure a space at a moment’s notice based on their needs. Flexibility was usually manifested in movable and customizable, and often casual furnishings and non-permanent whiteboard partitions. In other cases, flexibility involved building spaces that could adapt to users’ learning and technological needs 10 or even 20 years into the future.
2. While layouts and design preferences varied from one project to the next, one shared goal was the creation of spaces that supported a full spectrum of students’ learning needs. Most stakeholders said they were building spaces to support one or more of these types of academic learning activities: collaboration (82%), individual study (73%), point-of-need services (63%), or “occasional” sessions taught by campus faculty (53%).

<sup>5</sup> For discussions of threats to the future of libraries, see: B.T. Sullivan, (2011, January 2). Academic library autopsy report, 2050. *Chronicle of Higher Education* and J. Thompson (1983). The end of libraries. *The Electronic Library*, 1(4), 245 – 255.

<sup>6</sup> In a flipped classroom, student class time is spent working collaboratively to solve problems and advance new ideas; watching a professor’s videotaped lecture or reviewing course materials is done elsewhere and on a student’s own time before class. See: J.L. Bishop & M.A. Verleger (2013, June 23). The flipped classroom: A survey of the research. *ASEE National Conference*, Paper #6219.

<sup>7</sup> B. Sinclair, (2007). Commons 2.0: Library spaces designed for collaborative learning. *EDUCAUSE Quarterly*, 4, 4-6.

<sup>8</sup> We have paraphrased the question used in our text, based on what a librarian and an architect both described during interviews.

<sup>9</sup> Project Information Literacy (PIL) is a public benefit nonprofit conducting ongoing, national studies about today’s college students and the future of libraries. PIL is directed by Alison J. Head, Ph.D., who is a Research Affiliate at the metaLAB (at) Harvard University and a Visiting Scholar at the University of Nebraska-Lincoln’s University Libraries. This research was sponsored by a Strategic Research Grant from the University of Washington Information School, where Head was a Research Scientist (2009 – 2016). For more information about PIL, see <http://projectinfoit.org>.

3. In most projects we studied, librarians and architects defined users as students, rather than the faculty, researchers, librarians, and library staff that also used campus libraries. This finding is troubling since faculty are directly responsible for designing and delivering learning opportunities to students in addition to having their own needs as scholars and researchers. But when budgets required sacrifices, improvements for collection spaces and library staff were the first to be eliminated in favor of protecting student spaces.
4. Librarians and architects placed importance on what students needed in their libraries. Yet, less than a third of the sample (31%) said they used formal methods to systematically collect user data as part of the planning process. Some stakeholders had surveyed students (27%) at the beginning of projects while others held focus groups (23%) for collecting data about library uses.
 

**. . . less than a third of the sample (31%) said they used formal methods to gather systematic user data from students or faculty as part of the planning process.**
5. Once a project was completed, formal evaluation metrics were rarely used, whether project costs were \$2 million or \$100 million. Instead, librarians, and architects to a lesser degree, used standard assessments of library usage, such as gate counts (34%) and usage statistics about library resources (20%), such as e-resource downloads. Barriers to conducting assessments were logistics, time, energy, or available expertise.
6. From our interviews, the most-cited best practice was the need for good communication. Continuous staff updates, ranging from individual meetings with library units to hosting campus-wide forums were critically important for establishing a sense of ownership for a new space, according to librarians. Taking time to build grassroots support with all constituents helped gain consensus about design choices at top levels later on, architects added.
7. Another frequently discussed best practice by librarians was the library tour. Many librarians said they had visited other campuses to examine recently constructed library spaces. From discussions with their colleagues on other campuses, librarians gathered anecdotal data about ideas to use in their own projects. Equally important, they discovered where projects had fallen short once a building was in use.
8. Even though librarians and architects came to library projects from vastly different professional backgrounds, they often became kindred spirits in the creative process. Ongoing design discussions among steering committee members were, in most cases, fertile ground for sharing ideas. When and if debates arose, they were often between architects' preferences for aesthetics and librarians' concerns about the functionality of spaces.
9. A lack of control over high-level decision-making was a serious challenge for librarians. This was most pervasive during the selection of academic partnerships for learning support services space. In many cases, librarians said provosts and other high-level administrators had made these decisions very early on without librarians' input. The result was occasional clashes related to mission, culture, and the subsequent allocation of learning commons space.
10. Most projects in our sample took far longer to complete than first expected. Sometimes delays occurred when stakeholders left for another job and new stakeholders came in with different design priorities. In other cases, financing difficulties caused project delays.

Taken together, we found the success of library projects is dependent upon a shared knowledge and understanding of the sweeping learning, pedagogical, and research changes facing the academy. Librarians and architects need to work together to apply that knowledge and understanding to the unique environment and learning and teaching needs of their specific institution.

The librarians and architects we interviewed placed a premium on designing user-centered spaces, yet few had systematically collected input from users for making pre-design decisions or conducting post-occupancy evaluations. If user input was collected, it was usually from a sample of students, but not of faculty. Our findings suggest the planning and design of library learning spaces requires librarians and architects to have a deep familiarity with *all end-users* and what they need to be productive as learners. Only then can the novelty of a space design that puts users first be unpacked. The future of academic libraries demands nothing less. ❖

## Approach

The research conducted at PIL is a series of national studies that investigates what it is like to be a college student in the digital age. Since 2008, we have studied how college students conduct research and find information both for their coursework and to meet the demands of everyday life. We have surveyed over 13,000 undergraduates from more than 60 colleges and universities in the US as part of our ongoing research.

As information scientists, we use social science research methods. We work in small research teams and collect qualitative and quantitative data from a sample of subjects in different higher education institutions. We seek to more deeply understand how college students function in the digital age – their information tasks, their situations, their solutions, and their systems. Moreover, we want to learn how these “early adults” resolve issues of credibility, authority, relevance, and currency in the resources they use.

Taken together, our research is a study of the gaps between how students find and use information, the sources and systems they use, and the expectations instructors, librarians, and employers may have about their information-seeking behaviors.

In previous studies, we have examined the role that academic libraries as well as the internet play in students’ lives. In our 2012 field study of students working in their campus libraries during the final weeks of the term, we found most were there because they valued libraries as a place to study. Students used the library during this time less as a source of research material than as a refuge from social distractions brought on by all of the technology and apps that permeate their lives.<sup>10</sup>

At the same time, our research has found that students do take advantage of library resources throughout the rest of a term that are available to them. In our 2013 study, we found eight in 10 of the college sophomores, juniors, and seniors (83%) surveyed used library databases, such as JSTOR, for course-related research — almost as much as they used Google search (87%).<sup>11</sup> Moreover, the same sample reported searching the library shelves (64%) in the physical library almost as much as Wikipedia (65%).

Findings such as these underscore the ongoing and complex changes in academic libraries. For centuries, the academic library stood at the center of almost every college and university campus, a testament to the value of curated knowledge and a treasured reserve for learning. Books were the medium in this classic model. Librarians protected and granted access to the collection. Librarians, as one architect put it, used to be much like the Vatican’s Swiss Guards.

Today, the very core of the academic library mission is under scrutiny. Librarians find themselves continuously asking how they can provide facilities that both foster learning and meet the changing needs of students and faculty? What is unique to libraries beyond being a nice, comfortable place to work, which is comparable to a coffee shop? What roles do, and can, campus libraries play in enriching student and faculty life?

More specifically, how can libraries continue to meet the changing learning, research, and teaching needs of an entire campus? How can libraries integrate services with the ubiquity of mobile devices, proliferating apps, evolving social media sites, and the popularity of peer-to-peer learning modes that are increasingly a part of students’ worlds?

**Librarians find themselves continuously asking how they can provide facilities that both foster learning and meet the changing needs of students and faculty?**

<sup>10</sup> A.J. Head & M.B. Eisenberg (2011). Balancing act: How college students manage technology while in the library during crunch time. Seattle, WA: Project Information Literacy Research Report, the University of Washington Information School, 49. The sample was 560 undergraduates from 10 campuses distributed across the US.

<sup>11</sup> A.J. Head (2013). Learning the ropes: How freshmen conduct course research once they enter college. Seattle, WA: Project Information Literacy Research Report, the University of Washington Information School. 24-26. The sample was 983 college sophomores, juniors, and seniors that responded to an open survey PIL posted on the EasyBib site, an Imagine Easy Solutions flagship product.

## Matter at Hand

There are no definitive answers to questions like these. When we searched the recent library literature we found nearly 600 English-language sources on the topic of reconfiguring library space.<sup>12,13</sup> Most of this literature consisted of how-to accounts on space planning, design, and implementation as it applies to a single project and meeting a specific user group's needs.

Such reports are valuable for sparking ideas and solutions, but this piecemeal approach has left a knowledge gap for readers looking for their own solutions.<sup>14</sup> Ultimately, what we found missing are relevant and up-to-date studies that identify useful solutions and best practices from a group of projects — not just a single undertaking.

What we believe is needed is more research about how librarians and architects most situated in the forefront of library learning space projects make planning decisions, work together, and employ best practices. Using interviews as our methodological approach, we pulled together disparate and tacit pieces of existing knowledge about planning learning-centered library spaces, based on discussions with stakeholders in our sample.

**Ultimately, what we found missing are relevant and up-to-date studies that identify useful solutions and best practices from a group of projects — not just a single undertaking.**

Four sets of questions framed our inquiry about the 22 different projects studied:

1. What learning activities do new library spaces frequently support? What design components, design elements, and layouts are essential to designs? What challenges occur when stakeholders begin translating design goals into tangible designs?
2. In what ways do users fit into the planning and design process? What measures of success are stakeholders using, if any, for assessing the use of library learning space once it is completed, and what do these measures tell stakeholders?
3. How do librarians and architects work together when creating designs for library learning spaces? How do each field's values, knowledge, and expertise inform design priorities? What similarities do librarians and architects share? What communication challenges frequently occur on projects?
4. What best practices are librarians and architects applying for planning and implementing library learning space designs in our sample? What "worst practices" have they learned through the process?

To respond to these study questions, we conducted 49 in-depth telephone interviews with library learning space stakeholders — librarians, architects, and library consultants. These stakeholders had collectively worked on some of the same projects and were at the forefront of decision-making about designs. We used interviews as our methodology, since interviews allowed us to ask open-ended questions that could be processed more freely.<sup>15</sup> We studied a variety of library space projects in institutional settings in the US and Canada. Projects making up the institutional sample were represented by four community colleges (18%), 11 public universities (50%), and seven private colleges and universities (32%). Figure 1 depicts the institutional sample and the library learning space projects that were the topic of the interviews.<sup>16</sup>

<sup>12</sup> Alison Head (PIL) and Deborah S. Garson, Head of Research and Writing Services at the Graduate School of Education at Harvard University, conducted the literature search in summer 2015. This entailed a search for articles published between 2010 and 2015 from around the world in library and information science scholarly journals, conference papers, and book chapters. Two databases were searched: Library and Information Abstracts (LISA) and Library Information Science Source (LISS). An annotated list of Further Readings at the end of this report features some of these readings.

<sup>13</sup> Beyond the scope of this study but well worth reading is *The state of academic librarian spaces* (2015). Watertown, MA: Sasaki Associates. [https://issuu.com/sasakiassociates/docs/2015\\_0403\\_libraries\\_report\\_final\\_fo](https://issuu.com/sasakiassociates/docs/2015_0403_libraries_report_final_fo). Survey findings are presented about how academic librarians (N=402) "interact with and respond" to their public and private workspaces as their profession, users, and buildings have changed.

<sup>14</sup> A notable exception is the 2013 "Learning space toolkit," a web-based guide for developing "technology-rich informal learning spaces," funded by the Institute of Museum and Library Services. Partners on this effort were North Carolina State University (NCSU) Libraries, NCSU Distance Education and Learning Technology Applications (DELTA), strategic consultants Brightspot Strategy, and AECOM, <http://learningspacetoolkit.org/>

<sup>15</sup> For a discussion of the methods used for this study, see the Methodology section at the end of this report (included in the full version of the report only).

<sup>16</sup> In Figure 1, the description of the projects that appears in the last column, "Learning Spaces Created," was taken from questionnaire responses that librarians in the institutional sample provided. Some of the projects in the list included renovations to other parts of the library that were not necessarily learning spaces.

**Figure 1: Institutional Sample**

College / University	Location	Type	Focus of the Learning Spaces Created
Augustana College	Rock Island, IL	Private	Center for Student Life
California State University, Northridge	Northridge, CA	Public	Learning Commons
College at Brockport, SUNY	Brockport, NY	Public	Library public services renovation
Colorado Mesa University	Grand Junction, Co	Public	Library renovation into learning space
DePaul University	Chicago, IL	Private	Information Commons (Learning Commons + Scholar's Lab)
Foothill College	Los Altos Hills, CA	Community College	Renovation of library
Frederick Community College	Frederick, MD	Community College	Information Commons
Gonzaga University	Spokane, WA	Private	Learning support services expansion
Indiana University	Kokomo, IN	Public	Center for Teaching, Learning & Assessment
Mount Royal University	Calgary, Alberta	Public	New library building construction
Northeastern University	Boston, MA	Private	Learning Commons (Audio and Video Studios + Digital Scholarship Commons)
Portland Community College	Portland, OR	Community College	Library remodel into learning space
Ryerson University	Toronto, Ontario	Public	Student Learning Centre
Salisbury University	Salisbury, MD	Public	Main Library + Academic Commons
Stonehill College	North Easton, MA	Private	Discovery & Collaboration Space
Tri-County Technical College	Pendleton, SC	Community College	Learning Commons
University of California, Santa Cruz	Santa Cruz, CA	Public	Active Learning Classroom
University of Miami	Coral Gables, FL	Private	Learning Commons
University of North Florida	Jacksonville, FL	Public	Learning Commons
Santa Clara University	Santa Clara, CA	Private	Learning Commons renovation
University of Texas, Austin	Austin, TX	Public	Learning Commons
University of Washington	Seattle, WA	Public	Active Learning Classrooms

*N = 22 library learning space projects and 49 stakeholder interviews.*

Figure 2 and Figure 3 present descriptive details about the projects in the institutional sample, based on two building specifications — cost and size.<sup>17</sup> As a whole, projects ranged in cost from \$1 million (27%) to over 100 million (9%).

In many cases, the amounts reported in Figure 2 reflected the cost of a single phase of a much larger-scale renovation that took years to complete. Funding for projects came from institutional sources, gifts, and donations. Another funding source for public institutions was public funding from state or province initiatives.

**Figure 2: Cost of Projects**

COST (US Dollars)	COUNT	FREQUENCY
\$100 million to \$199 million	2	11%
\$30 million to \$99 million	1	5%
\$10 million to \$29 million	3	16%
\$6 million to \$9 million	2	11%
\$1 million to \$5 million	5	26%
Under \$1 million	6	32%

*N = 19 projects (3 with missing data). Percentages may not add to 100% due to rounding. N = 19 projects (3 with missing data).*

**Figure 3: Total Size of Library Projects**

SIZE (Square Footage)	COUNT	FREQUENCY
Over 100,000 square feet	3	16%
50,000 to 99,999 square feet	6	32%
30,000 to 49,999 square feet	3	16%
15,000 to 29,999 square feet	2	11%
1,000 to 14,999 square feet	3	16%
Under 1,000 square feet	2	11%

*N = 19 projects (3 with missing data). Percentages may not add to 100% due to rounding. N = 19 projects (3 with missing data).*

<sup>17</sup> The sample size for Figure 3 and Figure 4 is 19 projects, since three institutions in our sample did not have these data available to report at the time of our study.



## A Brief History of Learning Spaces in Academic Libraries

Our study focused on the future of learning space design in academic libraries. But what is a *library learning space*? Discussions and debates over this question have coursed through the higher education literature for more than 25 years. One strand of research has delved into the recent evolution of academic library learning spaces.<sup>18</sup>

Many scholars date the beginning of the learning space movement in higher education to the early 1990s. At this time, the traditional college classroom began undergoing great changes due to advances in information technology. Wireless connections enabled real-time and asynchronous experts to be patched into teaching sessions. PowerPoint presentations were being captured for later viewing and review. Web content and searching became integrated into class lectures and problem solving exercises. As a whole, constructivist learning for understanding and discovery began to replace traditional teaching and learning and the activity of memorization and recall.<sup>19</sup>

During this time in academic libraries, *information commons* were built in response to new pedagogical approaches and the rapid growth of IT in education.<sup>20</sup> These early information commons were akin to computer labs. What was unique about information commons was the relationship-based service model that libraries employed.<sup>21</sup> Information commons provided students with cross-trained staff, technology support and reference triage.<sup>22, 23</sup> As such, this model for information commons was firmly grounded in the longstanding academic library tradition of service and support of students' learning needs.<sup>24</sup>

### Learning Commons

The next phase of learning space design began in the first decade of the 2000s with *learning commons*. This model has endured in academic libraries to this day. Unlike information commons, learning commons are full-service hubs for learning, research, engagement, and collaboration within the library.<sup>25</sup>

Students can gather and rearrange furniture to work collaboratively on their assignments. Digital tools – computers and software – support creative efforts. Small group meeting rooms are available. There is space for a combination of individual or group study.

A definite strength of the learning commons model is the variety of teaching and learning relationships that a single space can support. This is a place where students, faculty, or staff can study alone or collaboratively in addition to offering resources to find information. On any given day, students can work with other students. They can meet and work with faculty. In this sense, the outcomes of learning commons have evolved to include both information consumption and knowledge creation.

**A definite strength of the learning commons model is the variety of teaching and learning relationships that a single space can support.**

Academic support units from across campus are often incorporated into the learning commons space, such as the writing center, IT, distance education, or English as a Second Language (ESL) instruction, and tutoring services. These learning partners complement the mission of academic libraries. Together, they share a commitment for ensuring success throughout the student educational lifecycle.

<sup>18</sup> D.R. Beagle with D. Bailey & B. Tierney (2006). *The information commons handbook*. New York: Neal Schuman; A. Turner, B. Welch, & S. Reynolds, (2013). Learning spaces in academic libraries: A review of the evolving trends. *Australian Academic & Research Libraries*, 44(4), 226-234.

<sup>19</sup> M. Brown (n.d.). Learning Spaces. EDUCAUSE, <http://www.educause.edu/research-and-publications/books/educating-net-generation/learning-spaces>.

<sup>20</sup> S. Bonnanda & T. Donahuea (2010). What's in a name? The evolving library commons concept. *College and Undergraduate Libraries*, 17(2-3), 225-233.

<sup>21</sup> D.R. Beagle (2004). From information commons to learning commons: A white paper for presentation at the University of Southern California Leavey Library Conference.

<sup>22</sup> Beagle, Russell, & Tierney (2006), op. cit.

<sup>23</sup> M.M. Somerville & S. Harlan (2008). From information commons to learning commons to learning spaces: An evolutionary context. In *Learning Commons: Evolution and Collaborative Essentials*, ed. B. Schader, Oxford, UK, 1-36.

<sup>24</sup> S. Bennett (2008). The information or the learning commons: Which will we have? *The Journal of Academic Librarianship*, 34(3), 183-185.

<sup>25</sup> "Seven things you should know about the modern learning commons," *EDUCAUSE Learning Initiative*, (2011, April).

## Library Learning Spaces

Today, another design wave of library space design is in process. Many in the field of higher education refer to this design phase as one that is focused on creating *library learning spaces*.<sup>26</sup> A top priority for these library learning spaces is to connect students to technology, information, and *co-curricular learning* — learning that deliberately complements the formal classroom activities, programs, and experiences that contribute to student learning. Ultimately, the emphasis is on holistic learning that may occur both inside and outside of the classroom.

Versatility is essential to the planning and design of such library learning spaces. That is, the same space can be easily reconfigured into gathering/meeting places, classrooms/meeting rooms, or computer labs/makerspaces to support a wide variety of learning activities that facilitate understanding and discovery. Additionally, space is often allocated to support the teaching and learning needs of students and faculty, such as the faculty development centers. In these situations, faculty have access to library expertise and resources as they co-create curriculum, including pedagogy and assignments.

Library learning spaces today may have active learning classrooms, immersive media labs, or digital training classrooms with the latest software. Regardless of what a library's learning space contain, the goal remains the same: to support the teaching, learning, and research that are the core mission of the 21<sup>st</sup> century higher education institution as it continues to evolve. ❖

## Detailed Findings

### Part One: Paradigm Shift

The design of learning space in an academic library can be as individual as a snowflake. From the exterior, no two projects in our sample looked remotely similar in siting, shape, or facade. Projects ranged from the construction of ultra-modern learning centers sheathed in glass to much-needed remodels of dimly lit last-century libraries.

We found there are no hard and fast rules for designing today's library learning spaces. Given this viewpoint and the changes in teaching and learning on campuses, academic library space design is a "moving target" as one university librarian said.

Where the projects we studied were most similar is in their commitment to changing the paradigm of the academic library's purpose. Campus libraries as monuments to silence with floors of stacks are remnants of the past and now completely unsuited to the teaching, researching, and learning needs of the digital age. Library projects today are about creating open, collaborative, versatile, and social spaces, according to our interviewees.

**. . . academic library space design is a "moving target" as one university librarian said.**

A metaphor that came up frequently in our interviews was the library as the "campus living room." Such library spaces were "welcoming," "warm," "safe" and intended to support the "social aspects" of formal and informal learning (Figure 4). Some stakeholders said they achieved this sensibility by placing oversized, comfortable chairs and couches near the entry of the library. Patrons used the space for reading, gathering, relaxing, and connecting to the campus high-speed Wi-Fi network.

Others said they replaced underutilized floors "consumed by shelving for books" with user-defined, open spaces. This translated into offering users configurable areas with movable whiteboards and seating, and ample power outlets. This way, students could set up a space to work and study alone, or together, as they pleased.

<sup>26</sup> A telephone conversation between Alison Head and Mary M. Somerville on October 24, 2016. The different phases of library learning space design were discussed Somerville's relationship-based service model for understanding the evolution of library learning spaces emphasizes the growing scope and increasing impact on students' learning.

#### Figure 4: What Architects and Librarians Mean When They Talk about Library Space Design

*The stakeholders we interviewed often used the same descriptive nomenclature — some architectural concepts, others library science terminology — to describe planning and designing academic library space. Definitions of the most- and least-frequently used terms are listed below. Our definitions have been derived from the interviewees and seminal works in both librarianship and architecture. A key after each definition shows the percentage of professionals who used terms, i.e., L = librarians, A = architects, LC = library consultants. PIL Researcher Erica DeFrain researched and compiled this list.*

1. **Collaborative:** Spaces designed for users to work together and use technologies to access information and share ideas, brainstorm, innovate, and practice presentations and work together on projects. Collaborative learning spaces are often manifested in configurable furnishings, small group meeting rooms and/or active learning classrooms. (L=82%, A=64%, LC=100%)
2. **Interdisciplinary:** Spaces, equipment, and services supporting a range of interdisciplinary learning needs across a given campus from arts and humanities to science, technology, engineering, and math. (L=73%, A=59%, LC= 60%)
3. **Flexibility:** Flexibility can have multiple meanings. Spaces can be configurable and have movable furnishings to support changing needs of users as they may define them at a moment's notice. Spaces can be prescient, so the evolving needs of users, and the IT they depend on, can be anticipated and considered for spaces 10 or 20 years into the future. (L=50%, A=77%, LC=40%) A related concept is "versatility," which one architect defined as a space that motivates users and "inspires different uses," e.g., the computer lab that also serves as a makerspace.
4. **Functional:** Functional design can be a process and an outcome. As a process, functionality refers to a set of practices guided by principle that produce positive outcomes; as an outcome it describes designs that work well and help users perform their assigned tasks. (L=59%, A=45%, LC=80%)
5. **Active learning:** This mode of constructivist learning calls on students to engage and solve problems while engaging in understanding and discovery. (L=18%, A=18%, LC=20%)
6. **Welcoming:** Warm, friendly, intuitive, and inviting spaces within a library, often at the point of entry and in other areas for collaborative learning. Spaces are manifested in large, oversized chairs and couches that create the feeling of the library as the "campus living room." (L=32%, A=82%, LC=0%)
7. **Open:** Large areas with uninhibited sight lines in order to minimize physical barriers, remove enclosed rooms or private offices, and emphasize collaboration and information instructional opportunities. (L=18%, A=68%, LC=0%)
8. **Social:** Mixed-use space where conversation, collaboration, and informal learning are encouraged, facilitated, and expected. A social space is also intended to support academic and leisure activities and events, and cafes/coffee bars, maker spaces, and art galleries. (L=27%, A=59%, LC=20%)
9. **Transparent:** An approach to showcasing learning activities taking place in a space through open concepts, low-profile technology and furnishings, and limiting physical barriers that might otherwise obstruct a user's open view. (L=5%, A=36%, LC=0%)
10. **Agility:** A space that is designed to be rapidly and easily transformed often, so that a broad range of user needs, both anticipated and not, are supported and served. Flexibility is a prerequisite for agility. (L=0%, A=9%, LC=0%)

**Works consulted:** Butler, A. & Baty, W. (2007). *Touring libraries*. N.p., Eigenbrodt, O. (2013); "The multifaceted place: Current approaches to university library space." *University libraries and space in the digital world*, 35-50; Forrest, C. & Hinchliffe, L. (2005). "Beyond classroom construction and design: Formulating a vision for learning spaces in libraries." *Reference & User Services Quarterly* 44(4), 296-300; Lassi, M. & Sonnenwald, D H. (2013). "The socio-technical design of a library and information science collaboratory." *Information Research: An International Electronic Journal*, 18(2); Latimer, K. (2011). "Collections to connections: Changing spaces and new challenges in academic library buildings." *Library Trends*, 60(1), 112-133; Wulf, W. (1989, March). "The national collaboratory." In *Towards a national collaboratory*. Unpublished report of a National Science Foundation invitational workshop, Rockefeller University, New York.

## Sources of Inspiration

The ideas stakeholders used for re-envisioning library spaces went beyond thinking of the library as the campus living room. Tours of libraries on other campuses contributed to planning possibilities as well as librarians' tours of their architects' projects elsewhere. Conferences on library design and assessment were another source.

In large part, first-hand observations and anecdotal evidence about how different library spaces were used helped inform librarians' design goals. For instance, one librarian at a small college said her project was inspired by the library's cafe:

*It was a classic situation, a board member comes in, pulls a book off the shelf, cleans off the dust and says, "This book hasn't been checked out since 1970 — can't we use this space in a better way?" I was already thinking about an update — we couldn't continue to justify all this space just to keep every book we ever bought, a standard for libraries before the digital revolution. In the original library, we always saw students preferring to study in the coffee shop rather than other areas. We used this in our redesign. We wanted the renovation to ensure there were still elements of the traditional library like silent areas, but also to create new multi-use space where students could study and where there's background noise, or where you can see and be seen. These students would be able to spread out into areas that might otherwise be used differently in a more traditional library.*

As this quote suggests, stakeholders wanted the library to be both a desirable destination on campus as well as a "symbol of learning." Or, as one librarian put it: "The library needs to be a part of the students' journey during the day." In this sense, librarians and architects wanted to create a library that was a hub for learning, research, and discovery. This necessitated the creation of an array of spaces where students and faculty could go to collaborate, create, contemplate, learn, research, eat, socialize, or study in solitude.

**. . . stakeholders wanted the library to be both a desirable destination on campus as well as a "symbol of learning."**

## Academic Learning Activities

The variety of academic library space designs in our sample led us to ask different questions about commonalities in the institutional sample. What academic learning activities did stakeholders say their learning spaces were intended to support? What can be learned about the design priorities that librarians and architects have for creating such spaces?

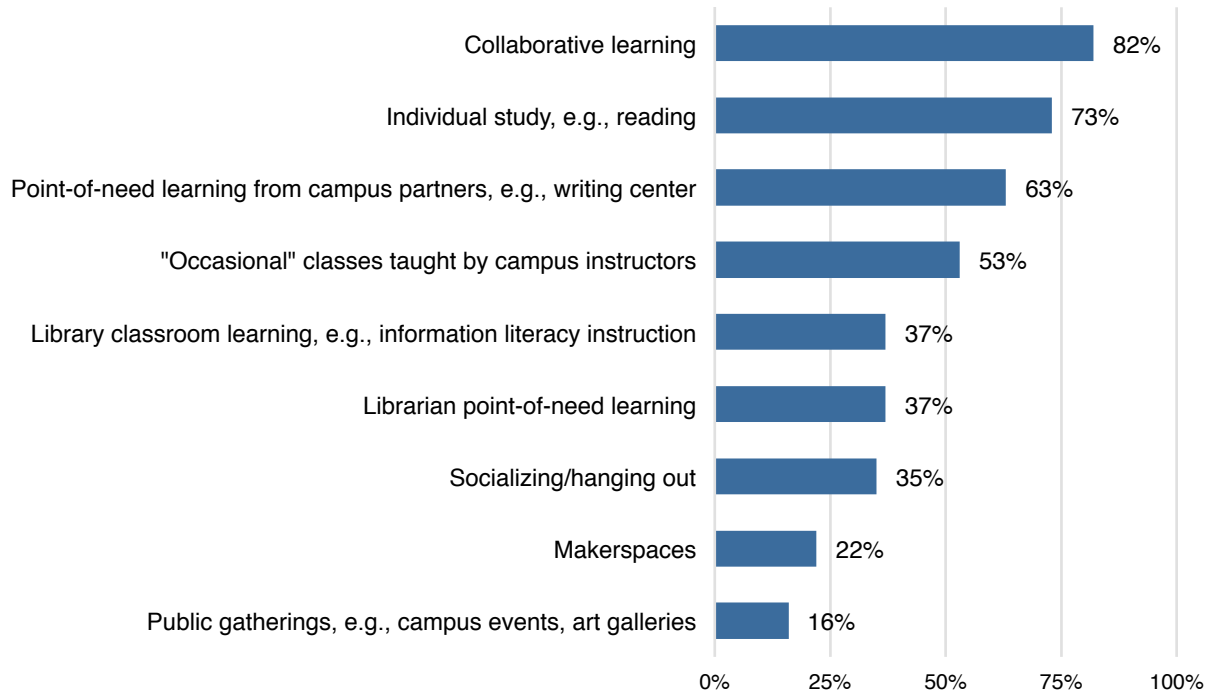
To answer these questions, we conducted a systematic content analysis of the interview logs. We used nine coding properties to represent learning activities discussed in the interviews. Properties were identified based on the frequency in which stakeholders described — in their own words — how their projects qualified as learning spaces and what academic learning activities the spaces were intended to support.<sup>27</sup>

If an interviewee used the same language to describe a learning activity more than once, we counted it only once in our results.<sup>28</sup> Figure 5 presents a bar chart with the coding results for learning activities supported in descending order. The frequencies indicate what percentage of the sample discussed each one of the nine learning activities in their interviews. As a basis of comparison, in Figure 6, we provide a data details chart. This chart segments the same results in Figure 5 by librarians, architects, and library consultants.

<sup>27</sup> The inter-coder reliability for our results was .84, considered "almost perfect" by communication researchers when testing with Krippendorff's Alpha.

<sup>28</sup> Coders used *manifest coding* to count the instances of concrete language in the stakeholder interview logs.

**Figure 5: Supported Learning Activities in New Architectural Spaces**



**Figure 6: Data Details for Learning Activities by Stakeholders' Professional Affiliation**

ACTIVITIES	LIBRARIANS	ARCHITECTS	CONSULTANTS	TOTAL
1. Collaborative learning	<b>17</b> <b>77%</b>	<b>19</b> <b>86%</b>	<b>4</b> <b>80%</b>	<b>40</b> <b>82%</b>
2. Individual study, e.g., reading	16 73%	17 77%	3 60%	36 73%
3. Point-of-need learning from campus partners, e.g., writing center	<b>17</b> <b>77%</b>	11 50%	2 40%	31 63%
4. "Occasional" classes taught by campus instructors	12 55%	12 55%	2 40%	26 53%
5. Library classroom learning, e.g., information literacy instruction	10 45%	7 32%	1 20%	18 37%
6. Librarian point-of-need learning	11 50%	5 23%	2 40%	18 37%
7. Socializing/hanging out	8 36%	9 41%	0 ---	17 35%
8. Makerspaces	3 14%	7 32%	1 20%	11 22%
9. Public gatherings, e.g., campus events, art galleries	4 18%	4 18%	0 ---	8 16%

Ordered from most to least mentioned activities in interviewees' discussions about their projects. N= 49 stakeholders, 22 academic library learning space projects. Bolded figures represent most frequent responses.

As a corollary to the results, and as a basis for discussing design preferences for different kinds of space, we focus on the top four categories of learning activities projects were intended to support. We do not intend these categories to be comprehensive of all types of learning activities that may, or may not, occur in academic libraries. Rather, these categories represent the types of academic learning that were most frequently supported in our sample of 22 recent library projects on US and Canadian campuses.

The four academic learning categories in descending order were:

- 1) Collaborative learning
- 2) Individual study
- 3) Point-of-need learning
- 4) "Occasional" classes taught by campus instructors

### How Did New Architectural Space Support Different Kinds of Academic Learning?

**1) Collaborative learning (82%).** Stakeholders placed the highest premium on the creation of space for collaborative learning. In the traditional sense, this translated into adding small-group meeting rooms where students could work together on team projects and exchange ideas. The need for such rooms on most campuses has grown with instructors' increasing preference for team-based, problem-solving assignments.

At the same time, existing meeting rooms were being updated into technology-rich and more transparent spaces. For instance, power outlets were being added along with writing surfaces, such as white boards and glass-surface marker boards. A glass panel was often used to bring natural light into rooms. This design element also allowed for an unobstructed view from the meeting rooms, which, in some cases, created safer, more open working environments.

Space outside of meeting rooms was often also designated as collaborative space. Some architects said large windows were essential to let in plenty of natural light from outside. In these open areas, students could gather informally to work together, or study in private. Critical components were movable tables, chairs, and white boards – and plenty of high-speed internet access. Students could easily reconfigure these areas to suit their needs.

In order to create these open spaces in library renovations, many books in the library collection ended up being stored in high-density storage units. Reference books remained on the shelves in some settings to convey an accumulation of knowledge, or as one librarian put it, a kind of "wallpaper" for the library, since the books, according to librarians, were infrequently used.

Some of the most innovative designs in our sample were intended to stimulate impromptu exchanges, or what one architect called "happenstance learning." To promote these "informal collaborations," some architects installed bleachers or Roman stairs near the library's entrance. From their perch high above the entry, students could watch others enter below while they socialized or studied together.

In other cases, architects said they had pushed open designs further than what traditionally qualifies as spaces in a 20th-century library. These architects intentionally left a large space open and undefined to see how students would use it. For instance, the construction of a student learning center, connected to the library at one university, designated an entire floor into an area that the architect nicknamed "The Beach." The librarian on this project said:

*I've met no one who goes in there for the first time and doesn't just gasp. It's one huge open floor – there's not a table in it – and it's all done in ramps with this beautiful maple wood, so it looks like sand dunes. In the bottom corner there's dark blue carpet, so you just walk in there, and it's surrounded by glass and it just calms you right down, and so it's a place to go and chill for a while. We've had some students come in wearing bikinis and lie down on the Beach Area – it's whimsical; students seem to really appreciate that.*

**Some of the most innovative designs in our sample were intended to stimulate impromptu exchanges, or what one architect called "happenstance learning."**

Once they saw the space the quote describes, students easily figured out they could settle in, relax, study, and take advantage of a high-speed internet connection while enjoying the view from the large windows surrounding the room. Open spaces like these were built to be versatile. Undefined spaces could be easily reconfigured for public gatherings, such as rallies, dance productions, fashion shows, or art exhibitions.

**2) Individual study (73%).** Not all planning was driven by collaboration and digital demands. A large majority of stakeholders wanted to increase the amount of space set aside for individual study. These learning spaces have been a traditional part of academic libraries for centuries. Today, quiet study areas remain in very high demand. As one architect, who had worked on library projects for over 15 years, pointed out: “Collaboration only works in academic libraries when it is paired with space for contemplative and individual thought.”

In almost all of the projects we studied, the classic study carrel was replaced. Updated carrels were installed with wide, low-walled units that accommodated laptops, knapsacks, and students’ need to spread out to get work done. These spaces often had a variety of seating options, such as alcoves, four top tables, and many kinds of comfortable chairs. Furniture had built-in power outlets so students could plug devices in directly where they were sitting, rather than stringing their electrical cords across an area.

**“Collaboration only works in academic libraries when it is paired with space for contemplative and individual thought.”**

Even though space for individual learning may seem more straightforward than other spaces needed in the library, there were design challenges. As one library consultant working on a new building for a small campus said:

*The current library didn't have enough seats during peak times. Yet everyone tells students, “Do your homework at the library, that's a great place to study.” So, then students get there, and there are no seats. We knew doubling the amount of seats in the new building would have an immediate impact on student success. Another problem with the existing library was their quiet study spaces and their collaborative study spaces were all mixed up. If students were looking for a quiet place to study they couldn't find it, and if someone's looking for collaborative space, they were constantly being quieted because they're bothering individuals.*

In cases such as this one, a quiet, and/or a silent study area were often designated as part of a building project. Students could find a study place that was physically separate from areas for collaborative work. Long study tables were used in some libraries. This way, students could spread out, see inside and outside of the room, and work “alone together.”

**3) Point-of-need learning from campus partners (63%).** Almost two-thirds of projects had “one-stop-shopping” areas for student learning and teaching success – one of the signature services of the learning commons model. Non-library partners making up this array of services ranged from writing centers and math labs to peer-to-peer tutoring and teaching and learning excellence centers.<sup>29</sup>

A variety of seating options – meeting pods, alcoves, and offices – was typically installed to support different kinds of one-on-one tutoring sessions as well as the teaching needs of different partners. Separate rooms for hosting student, faculty, or library staff workshops were often included. These spaces were equipped with the latest software and hardware so users could practice presentations or receive hands-on training. At the same time, more intensive information literacy instruction by librarians could be provided in these areas of the library.

Stakeholders said they especially wanted their designs to “decrease barriers” and the “stigma” of asking for help. One solution was to use cubicles and small offices with glass for acoustic isolation. This way, students could not hear the tutoring session, but could see that help was available.

At the same time, stakeholders wanted to increase the “connectedness” between services. Some architects said they placed support services near a library’s entrance so tutoring areas could be more readily found. Individual service points were often collapsed into a common “Ask Desk” to eliminate the separation of services. Signage and

<sup>29</sup> Librarian point-of-need learning partners that shared this space, such as reference services, are a different category in our coding results, see Figure 6. In some cases, reference services were integrated into non-library learning spaces. In other cases, reference was located apart and somewhere else in the library.

wall colors were updated to enhance wayfinding and ease of access. Still others said they combined writing centers, reference services, and book retrieval from high-density storage units, so there was unified support throughout the student research process.

As one architect designing a new library building for a community college explained:

*You shouldn't have to go to the library and then go to some far-off place that's tucked in the corner to get help for all your questions. So, we've incorporated tutoring and reference services into the learning commons. Basically, when you come to the learning commons we've created, it's not a matter of, "I just need to get a book for my research paper." The questions are also, "Do I actually know how to write a research paper?" and "How can I get the books and research materials I need?"*

Some of the most innovative designs for point-of-need learning in our sample were newly built structures that included student success centers. These structures presented co-curricular learning possibilities for the next wave of library design – a place where students take charge of their own development, whether it is improving their academic performance or expanding their own learning opportunities with the wider curriculum a campus offers.

In some cases, space was provided for advising support, peer-to-peer writing labs, workshops, dining services, the registrar, financial aid, and IT assistance. Multi-purpose buildings like these presented new, and exciting opportunities for the entire campus, including drawing students and faculty in who might otherwise never set foot in the traditional campus library to ask for help.

**4) “Occasional” classes taught by campus instructors (53%).** Classroom space has always been at a premium on college campuses. Our sample of library space projects was no different. More than half of the stakeholders we interviewed added non-library classroom space as part of their building projects to meet the growing demand from faculty across their campus. Librarians sometimes referred to these classrooms as “occasional spaces” since instructors could use these classrooms for one-time meetings or a class that did not run the full term. In some cases, the campus master scheduler, not the library, managed scheduling for these classrooms.

The layout of these classrooms often resembled a computer-training classroom used for supporting formal learning activities. Students could work on library-provided desktops or laptops while instructors taught from a lectern with a computer that incorporated the use of library and other digital resources.

In other cases, classrooms had a traditional layout with desks in straight rows facing the front of the classroom where the instructor stands or sits. When these classrooms were not scheduled for a class, students or faculty could use the space to work on projects of their own. From an architect's perspective, this created “agile” classrooms that anyone could use.<sup>30</sup>

But this was not always an option for libraries in our sample. Nowhere was this more prevalent than with the installation of “active learning classrooms” in four (18%) of the 22 library projects in our sample. Active learning classrooms are one of the most-talked about advances in collaborative teaching and learning environments on campuses today.

The active learning classrooms we studied were student-centered learning spaces infused with technology so teams can work in real-time on problem-solving exercises for a course.

Large, round, configurable tables with seating and individual screens were used so groups could easily work together and move furnishings as needed. Switching technology connected devices to a fixed flat-panel display projection system. Multiple white boards or glass-surface marker boards covered the surrounding walls of the classroom, so ideas could be shared.

**Active learning  
classrooms are one of  
the most-talked about  
advances in  
collaborative teaching  
and learning  
environments . . .**

<sup>30</sup> See page 10 for a definition of agility in Figure 4, “What Architects and Librarians Meant When They Talk about Library Space Design.”



What may be the most unique feature about active learning classrooms is there is no focal point to the classroom. Classrooms are set up for collaborative problem-solving tasks rather than faculty lecturing, or librarians providing training workshops.<sup>31</sup> When libraries in our sample built such a classroom, the campus-wide attention the library received was met with mixed reactions by library staff.

One librarian from a large public university described her experience with the active learning classroom:

*We have the only active learning classrooms on campus in our library. Now we're being seen as part of the conversation about pedagogy in ways that the library has not traditionally been. The downside though is everybody and their mother wants to teach in these classrooms. To fight this, we had to make very strict policies and have to say no to people, which has been fine as long as we have had policies posted and we explain them. I've never said, "no" so many times in my entire life. It's not a bad problem to have — it's just a really different thing for me.*

In addition to scheduling challenges that this quote suggests, other librarians we interviewed said active classrooms definitely increased foot traffic in the library. This was not always seen as being a favorable outcome. As one librarian said, "we're already packed to the gills."

Still others discovered that their day-to-day operations were sorely affected by constant scheduling requests and the need to juggle endless requests for the spaces. Often librarians found being at the forefront of curricular change could be at odds with their longstanding mission of service and support of student learning in ways beyond their imagination – or control.

### Mutual Design Goals

Looking across the variety of learning spaces in our sample, a frequent goal was revitalizing existing but underused spaces. Many librarians said this meant removing stacks of books that rarely circulated. This created room in the building footprint to add study carrels and open seating to support students' individual study and research needs.

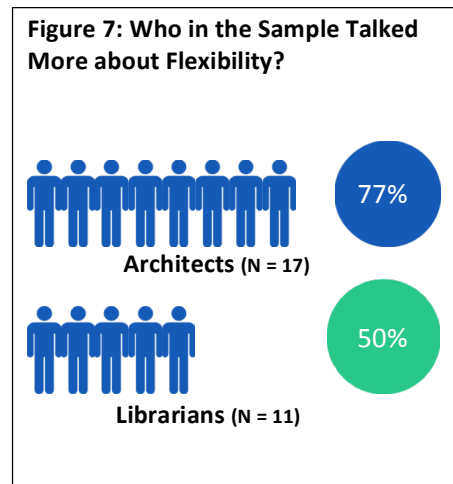
Some librarians said they moved books into storage to create space for student art exhibits to support informal learning activities, which met another campus-wide need. Still others provided more spaces for experimentation with digital devices or software that students might not need for a course but had heard about and wanted to try.

The bottom line in all of these cases was increasing the "functionality" of library spaces. In relation to the projects we studied, functionality required knowing who used a space, why, and how the design of a space could best support users' tasks.

Another frequently discussed design goal was the creation of flexible spaces (Figure 7). Several architects defined flexibility in terms of the building itself. In the words of one architect, they wanted to create a building that was adaptable to change and "strategic."

Planning strategically in this case meant anticipating change. As one architect working on a renovation at a small college summed it up:

*The flexibility piece is becoming not just a nicety – it's a requirement, especially since schools are looking at increasingly limited resources, a lot of deferred maintenance, and budget issues affecting their bottom line. This means they need multipurpose spaces – they can't afford the luxury of having a space sitting with the lights off anymore.*



<sup>31</sup> J. MacGregor (1990). Collaborative learning: Shared inquiry as a process of reform. In M.D. Svinicki (Ed.), *The changing face of college teaching*, San Francisco: Jossey-Bass, 19-30.

In other cases, flexibility corresponded to meeting users' changing needs on a more immediate basis. For example, architects created adaptable designs that allowed students to define their own working spaces. This approach entailed installing meeting pods where people could informally gather and work together in breakout area as ideas or problems arose.

Some architects said they incorporated ideas they had used in designs for high-tech companies. A few others applied the principles of "universal design" to libraries so that everyone, even those with mobility impairments, had the "comfort of being able to move around freely through different table configurations."

As a whole, we found few interviewees discussed creating spaces with the sole purpose of providing sophisticated technologies to users. Instead, most of the projects we studied focused on updating existing IT with newer computers to be used in spaces throughout the library. One reason for this approach was limited project funding. This fiscal condition precluded the possibility of creating a library of tomorrow with a full range of different digital learning spaces.

### Design Challenges

Every design project has its share of challenges. The projects in our sample were no different. Some of these problems were inevitable, such as having to make difficult choices about design features in the face of dwindling budgets. Other difficulties arose from trying to get buy-in from library staff or higher-ups on the problems that would get fixed, so that projects could move forward and stay on course.

At the same time, there were specific challenges that were inherent to the design of spaces. In this part of the report, we focus on "ensuing challenges" with design. We define these challenges as the problems stakeholders tackled when trying to translate design goals into tangible designs. In Figure 8, we identify three categories of design challenges that interviewees most frequently discussed. We also offer some of the best practices and solutions that stakeholders discussed for resolving these design problems.

**Figure 8: Design Challenges with Library Learning Space Projects**

ISSUE	DESIGN GOAL	ENSUING CHALLENGES	BEST PRACTICES
<b>1. Noise Reduction</b>	Creating a hub for holistic learning, research, and teaching that supports a wide range of student and faculty collaborative and individual needs.	Managing noise levels in different areas of the library, (e.g., providing areas for individual, quiet study vs. areas for groups, gathering, and loud conversations).	Adding glass enclosures, ceiling baffles, and/or sound isolation technologies to manage noise levels, while building enough physical space between loud and quiet areas.
<b>2. Sharing Space with Learning Partners</b>	Providing a coherent student services space for campus-wide learning partners (e.g., writing center, IT, ESL instruction, and reference).	Accommodating teaching styles and the mission and culture of different learning partners that share the same space in the library.	Assessing partners' needs early on so that librarians and architects are aware of the furnishings, square footage, and management needs of learning partners they will be sharing space within the library.
<b>3. Power Outlets/ Capacity</b>	Providing enough power to support user-owned IT devices today and into the future.	Once a project was completed, some librarians discovered a shortage of power outlets in certain spaces, which compromised the ability to plug in IT devices.	From the outset of a project, making sure there are enough power outlets for plugging in mobile devices and also enough electrical capacity for all of the outlets to be fully functional.

*Ordered from most- to least-mentioned design challenges in interviewees' discussions about their projects. N= 49 stakeholders, N = 22 academic library learning space projects*

## Noise Reduction

More so than architects, librarians cited difficulties with reducing noise in response to users' frequent complaints. In most cases, this meant containing noise within collaborative spaces and keeping individual study areas quiet. As one librarian overseeing the building of a new structure said:

*During my library tours of other sites, I kept getting the same message from librarians about architects: Architects don't understand about noise. Architects always want big staircases that increase the noise – they don't get it. So right from the start, I told the architects on my project this is what I've heard from colleagues, so please bear in mind we want noise control. And, they delivered.*

Problems such as the quote suggests, were often remedied by installing a large panel of glass between quiet and collaborative spaces. Once in a while, an acoustics engineer was hired to install sound isolation technologies so that noise levels could be controlled or adjusted at different times of the day. In other settings, which had more room, quiet study areas were moved to a different floor so that there would be more physical space between entry areas with big staircases, gathering spaces, or collaborative team spaces.

## Sharing Space with Learning Partners

Another problem stakeholders frequently discussed was allocating space for campus-wide learning partners. Some of these partners required more square footage than was initially anticipated. In a few situations, the library's policy of providing students with access to meeting space, either mediated or completely unfettered, was foreign to these other academic units.

These challenges were often related to a much more serious problem. Many of the librarians we interviewed said they did not see themselves as having much control over the selection of partners they ended up sharing space with in the library. Time and time again, administrators assigned learning partners without input from librarians. One architect who worked on community college projects said:

*In a few instances, there were decisions being made by this core team at a campus-wide administration level and it excluded those that actually worked in the library. We weren't part of that conversation either. So, we didn't always know what had been decided, or why, and this made it difficult to keep the priorities we identified during the visioning process at the beginning of the project.*

A best practice, according to some librarians, was to participate more actively in the selection of partners with specified criterion. One librarian described using a selection criterion for partners that: (1) had similar goals as the library for teaching, learning, and research, (2) helped libraries strengthen areas where libraries are already strong, and (3) ensured libraries would continue to offer a range of learning support services to students. Other librarians in the sample suggested using a Memo of Understanding (MOU) between the library and the partners stipulating needs, wants, and requirements.

**Time and time again, administrators assigned learning partners without input from librarians.**

Another lesson learned during the planning phase for learning commons was to integrate library services, such as the reference desk, with non-library units in the library facility, such as the writing center. This solution provided opportunities for units to be better than any one of them could be individually. When separating non-library units from one another within a library facility, a displacement of learning services and internal territoriality was often the result.

## Power Outlets and Capacity

A frequent challenge that librarians also discussed was having enough "power." This translated as the having enough power capacity needed for users to charge their IT devices. Older spaces also needed to be retrofitted with enough Wi-Fi capacity to meet the demand. Many of the librarians said they discovered this issue when making library tours. There were rarely enough outlets for students to plug in their laptops or smart phones. As one librarian at a community college said, spaces without enough power end up being "vastly underused" by students.

A much more serious issue was when a library did not have enough electrical capacity for its outlets. These impediments were not insurmountable; some, though not all, could be remedied with solutions developed through stakeholders' joint efforts early in planning.

Taken together, our findings suggest that over time, a synergy can develop in partnerships between librarians and architects that help to solve ensuing design challenges. In the next section, we turn our attention to the two cultures of librarians and architects. We focus on how librarians and architects collaborate and work together to create the next generation of library learning spaces. ❖

## Part Two: Two Cultures

Librarians and architects inhabit different professional worlds. But when they are brought together to envision innovative libraries of the future, they are often surprised by their similarities. We found these commonalities can make them complementary collaborators in the creative process.

More than anything, the librarians and architects we studied shared a commitment to “putting users first.” This user-centered approach meant that the needs, wants, and limitations of users drove each stage of the learning space design process. In return, users played what one librarian called “a vital role in helping to determine the future of the library.”

Yet in nearly every project we studied, interviewees defined users as students, not as the faculty, researchers, librarians, and library staff that also used campus libraries. When budgets required sacrifices, improvements for library staff and collection spaces were the first to go to protect student spaces.

Despite the commitment to a user-centered approach, only a handful of the interview sample discussed what methods they used to systematically gather user input for planning and making design decisions, beyond usage statistics about resources, such as print circulation statistics or e-resource downloads.

Some interviewees (27%) said they surveyed students as part of the planning process to find out about library uses and study and research habits. Others (23%) said they conducted focus groups with students or faculty. Still others (14%) used interviews. “Furniture fairs” (18%) were held farther along in a project. These were open gatherings on campus where users could view, try out, and vote on different library furnishing options.

By far though, it was in ongoing “design discussions” in first-phase design meetings where essential details about users and space needs coalesced.<sup>32</sup> Based on our interviews, these small discussions often, though not exclusively, took place in steering committees for projects. One reason why these discussions were so beneficial to a project's success was they offered fertile ground for exchanging ideas.

In these discussions, librarians and architects often connected through similar values they had, such as the importance of students' needs when planning designs for new spaces. Both frequently discovered they were both skilled communicators, accustomed to working in – and through – groups. Another reason for the value of first-phase design meetings was that this is when a building program was developed. This was the document that architects produce has the planning usage details of a project that specify goals and requirements for spaces, such as estimated square footage, usages, and estimated costs.

**Despite the commitment to a user-centered approach, only a handful of the interview sample discussed what methods they used to actively gather user input . . .**

<sup>32</sup> As a point of reference, architects called this first phase of a project, where design discussions occurred, the “schematic design phase.”

## How Architects and Librarians See Each Other

How stakeholders described working with one another was useful for more deeply understanding how design decisions were made. In our interviews, we asked what architects had to say about the professional perspectives and design priorities that librarians brought to projects. We then asked librarians what architects contributed to projects.

Librarians were found to have “a strong sense of ownership” for library spaces and were “mission driven,” according to many architects we interviewed. These architects added that librarians were clear about planning and creating a design for “self-sufficiency” and one that facilitated “student learning success.”

Recurring phrases that architects in our sample used to describe working with librarians were “very observant,” “very detail oriented” and “extremely helpful.” One architect summed it up: “Librarians are comfortable getting into a lot of details;” far more than any clients on entirely different projects. What architects in our sample most marveled at was how much librarians already knew about the use of library spaces. One architect, a campus planner at a public university, said:

*They're seeing it every day – they're watching traffic patterns, and the comings and goings of students in the library whether they are dropping in for 15 minutes or a half hour. I'm not standing there eight hours a day and watching what goes on. It was these observations from librarians, what they see on a day-to-day basis, that was what was most helpful for us to hear, as architects.*

Librarians' perceptions of architects' competencies were equally favorable in many of our interviews. According to the librarians we interviewed, architects were adept at asking questions and then attentively listening to clients' responses. This was a skill that librarians said helped to facilitate planning and consideration of different design possibilities for spaces. A library director working on a renovation at a small college said:

*I had all these requirements for what I needed, such as teaching rooms with the comfy seating, but they were in my head – it was just a mish-mash of all these things were going into the same space – somehow! It was the architect who was able to create discrete spaces for all these activities. As some student walked into the room, the design signaled how the space is used and its purpose.*

Many librarians, like this one, prized an architect's ability to “see spatially.” As one librarian said of the architect she worked with, “he could look at a room and tell us the true dimensions – true dimensions equal true possibilities.” As another librarian said, “The firm was very good at translating what I wanted the building to accomplish and then turned these things into a three-dimensional building.”

From interviews like these, we concluded that the most successful projects had stakeholders who were deeply invested in the same process of collaborative design. This process was essential scaffolding for moving design discussions to a shared vision.

As one architect described it, “Not only was the product customized for the client, the design process is, too.” This sentiment was echoed throughout our interviews with architects. Another seasoned architect, working on a large university's library renovation, said of the outcome of his project:

*We didn't come in and say to the librarians, “Here's the form that we think that should be here, now back your stuff into it.” Actually, we started before pencil hit the paper and asked librarians, “What do you want this building to do? Let's make a shopping list.” And then, they could see with each thing we were proposing how it was directly targeted to solving something that they wanted to accomplish. Instead, we came to the table crafting a vision for the space that was a shared one.*

**As one librarian said of the architect she worked with, “he could look at a room and tell us the true dimensions – true dimensions equal true possibilities.”**

As this quote suggests, architects provided a process for the planning and design services for most of the projects in our sample.<sup>33</sup> Some of the librarians we interviewed said they hired architects for their design abilities as much as they did for the methodological approach. In these cases, architects brought to planning and guiding a project from beginning to end. Others said they relied on a campus facilities manager to guide and manage a project. Then again, in a few cases, librarians had hired library consultants to facilitate their project progress.

### Library Consultants

Specialized library project consultants played an important role as external experts to both librarians and architects in a handful of the projects we studied.<sup>34</sup> According to the librarians, consultants could identify trends in library design while sharing expertise from a range of previous projects. This makes a lot of sense, since almost two-thirds of the library consultants (60%) we interviewed had a Masters in Library Science (MLS) and had also work experience in libraries.

Some architects said they valued consultants for bringing focus and a participatory process to a project. Consultants, according to architects, often identified a design model for a project that drew on the lengthy discussions they had with librarians at the envisioning and planning stage.

Others said some consultants conducted surveys or interviews with users that could be used in the planning process. An architect said of the library consultant he worked with on a library renovation at a community college:

*We worked closely with the consultant to identify trends in the library field about how spaces were used for learning. It became clear that the library, which had not had any major renovations since the early 1990s, really needed to get with the program, especially if we were going take it to the next level to be on par with their peers. One of the things that came out of these discussions was students don't really live on campus, so the library is the heart of the college. That was one of the thoughts that we kept coming back to throughout our project.*

Not only did consultants work closely with librarians to formulate clear design goals, they worked to ensure that the goals were achievable and affordable. They also made certain that a project was meeting the practical needs of the library. Moreover, consultants translated the language that each profession used, explaining meanings so that designs took shape and projects could move forward.

### Compatible Communication Styles

Given our discussion thus far, it should come as no surprise that the most-cited best practice by the interviewees was the need for good communication. Communication, however, is a complex and a multi-faceted process for sharing information that can have different meanings depending on its context.

In Figure 9, we summarize best practices for design discussions among stakeholders, based on what stakeholders discussed in our interviews. We follow with a discussion of communication challenges in the projects we studied.

<sup>33</sup> "Defining the architect's basic services," (2007). AIA Best Practices, American Institute of Architects, <http://www.aia.org/aiaucmp/groups/secure/documents/pdf/aiap026834.pdf>

<sup>34</sup> There were five library consultants in our interview sample. In other words, consultants worked on 23% of projects in the institutional sample (N = 22).

**Not only did consultants work closely with librarians to formulate clear design goals, they worked to ensure that the goals were achievable and affordable.**

**Figure 9: Best Practices for Design Discussions by Stakeholders' Professional Affiliation**

LIBRARIANS	ARCHITECTS	LIBRARY CONSULTANTS
Sharing standard library usage data, such as circulation and e-resource download records, as well as observational and anecdotal insights with architects.	Asking questions about the “what” and the “how” of learning space usage and actively listening to responses.	Identifying field-wide design trends while working with librarians to create a process of aligning the library’s mission with stakeholders’ visions and developing clear and achievable design goals.
Knowledgeable about functionality of spaces while providing descriptions that are “detailed” and “practical.”	Ability to see “spatially” and translate clients’ needs into a “3D building” that is based on a shared vision.	Ability to translate nomenclature from librarianship as well as architecture to stakeholders so that meanings are clear.
Providing expertise and hands-on experience with the latest IT, software, and training needs.	Adhering to an architectural design process that progressively moves a project forward to a shared vision.	Serving as a liaison between librarians and architects and other stakeholders involved on a project.

Ordered from interviewees’ most discussed to least discussed challenges on library projects in the sample. N = 49 stakeholders, 22 library projects

### Communication Challenges

While many interactions between librarians and architects ended up being productive, few projects in our sample ran smoothly from start to finish. While stakeholders often complained about communication with higher-level administrators, we also found that miscommunication between librarians and architects could also hobble project progress. As one consultant on a learning commons project said:

*Often we come into a project as consultants expecting these committees to be highly functioning teams from the very beginning. But there’s actually quite a bit of storming that happens as librarians and architects get to know one another and as they get to be comfortable throwing out ideas or debating something in a friendly way. Being aware of the time needed, and incorporating opportunities to get to know one another and work together, was really important. We tell them you may have to do something twice or three times in order for it to really stick or get to the level of detail that is needed.*

What many communication battles in our sample boiled down to was the context that each of the two professions brought to the planning and design process. Some of the chronic tensions between librarians and architects were deeply rooted in each field’s values and professional training.

By far, architects and librarians said they clashed most often over aesthetics vs. functionality. Simply put, architects offered a range of “different possibilities” for solving clients’ problems in “aesthetically pleasing ways.” Librarians, however, placed a high value on “single solutions” and improving the “functionality” of spaces.

### Aesthetics vs. Functionality

Arguments over aesthetics vs. functionality took different forms. In our interviews, architects said they “believed in access to light and spaces of varying scale and qualities.” Librarians said they were committed to the “practicalities” of how spaces “would be used and by whom,” so they “could provide excellent service.”

While both of these stakeholders said that functionality was important, librarians insisted that functionality should not be sacrificed for the sake of aesthetic appeal. For instance, several librarians claimed that the furnishings selected by architects were both “too glam” and “unaffordable.” Another librarian said her committee became embroiled in discussions with architects about “hiding practical things from students.” Architects thought that bike racks in front of the library obscured the line of sight and should be moved elsewhere.

Some librarians discussed disagreements over access to the physical collection. Most librarians valued the collections and access to them as an important aspect of the user experience. Architects, however, were more

oriented towards the “feel of the whole user-experience” of an open space design; one that was uncluttered by book stacks. As one architect, who worked on a large public university renovation, said of some, but not all, librarians:

*Librarians love their books, so they're very hesitant to get rid of them, or reduce collections. So there's a difficult challenge with the direction that libraries seem to be moving vs. librarians that want to hold onto their books. There's that sensitive balance between keeping everybody happy and making sure that the space functions the way it needs to and moves forward. Keep in mind, that we try to design and plan for spaces to last 20 years before they're addressed again.*

Not all debates between librarians and architects stemmed from disagreements over aesthetics vs. functionality. Interviewees also discussed communication issues pertaining to the management of a project. We summarize these managerial challenges in Figure 10 and follow with a discussion.

**Figure 10: Communication Challenges on Library Learning Space Projects**

ISSUE	COMMUNICATION GOAL	ENSUING CHALLENGES	BEST PRACTICES
1. <b>Building Consensus</b>	Gathering feedback about library space needs and wants from a diverse range of potential library users.	Ongoing meetings with too many potential users from across campus can “muddle the message.” But having too few voices can keep constituents from having a sense of ownership.	Providing regular project updates in individual meetings with library units as well as campus-wide forums where progress is clearly communicated and openly discussed using different communication channels (e.g., presentations, websites, and videos).
2. <b>Project Interruption</b>	Defining a project’s scope from the outset and monitoring progress using a realistic timeline with benchmarks.	Staffing changes, especially among key stakeholders and/or the upper echelons of campus administration, can negatively impact the momentum of a project as well as communication processes.	Preserving the continuity of a project by tracking changes separate from the project scope and vision statement while obtaining stakeholders’ buy-in for each change.
3. <b>Inadequate Knowledge</b>	Sharing professional expertise and knowledge that is useful to the planning and design of spaces.	Discussions can suffer setbacks due to a lack of understanding about the nomenclature of architecture or librarianship.	Defining terminology used in librarianship or architecture early on is critical to understanding design possibilities and making decisions.
4. <b>Metrics for Evaluation</b>	Defining, as members of a steering committee, measures for evaluating the success of library projects once they conclude.	Librarians and architects have very few, if any, established measures for evaluating how new space facilitates learning and increases task productivity and success.	Developing systematic post-occupancy metrics, regarding how student success and learning is facilitated by the new spaces.

*Ordered from most to least mentioned communication challenges in interviewees’ discussions about their projects. N= 49 stakeholders, N = 22 academic library learning space projects.*

### **Building Consensus**

A frequent stumbling block for communication between librarians and architects was the number of participants in discussions. Some committees were just too big. In other cases, too many committees were involved in the design process.

Architects said when too many library staff members were included in nitty-gritty design discussions there was a breakdown in communication. Differences of opinion, tension between groups, and misunderstandings about needs and technical specifications often resulted.



What made this issue particularly thorny was there is no one-size-fits-all rule for committee membership. One librarian said she needed to pare down the design team from 12 members to six because “too many voices can muddle the message.”

But at the same time, other librarians said a worst practice for a project was having “too few voices.” If ongoing progress with a library learning space project was not openly discussed and clearly defined in regular exchanges and project updates, librarians said, staff morale and a sense of ownership about new spaces dramatically waned.

One librarian said it was important to hold meetings where everybody in the library was invited “so those voices could be heard, we could discuss, and move past some of those misconceptions and preconceptions.”

**If ongoing progress with a library learning space project was not openly discussed and clearly defined in regular exchanges, librarians said, staff morale and a sense of ownership about new spaces dramatically waned.**

### **Project Interruption**

Project interruption set up cascading communication challenges on the projects we studied. In some cases, funding shortfalls slowed library design projects. When funding issues like these arose, it took years to complete most projects. This was far longer than most librarians and architects had ever anticipated. Project fatigue among librarians and library staff was difficult to manage, too.

By far, the biggest cause of project interruption in our sample was staff turnover. In some cases, a change at the executive level impeded progress already made on a library learning space project, or moved it farther down the list of priorities. Some of the librarians we interviewed said they had inherited a library’s learning space project from a former Library Dean, when planning – and discussions – was already underway. For instance, one said she grappled with whether or not to keep the atrium from an original design done 10 years earlier.

Since time had passed, these original designs needed to be revisited. Sometimes newer technologies needed to be integrated into spaces to keep the library current and costs went up. At other times, new curricular initiatives required different kinds of spaces. One librarian said new curricula in digital humanities and big data required the library to have new technologies in addition to a greater number of collaborative meeting areas.

### **Inadequate Knowledge**

The specialized language that librarians and architects used on projects could be a source of serious miscommunication. As one architect explained, librarians and architects had “shared respect” for “notions of cultural and social learning and ideas from places in ancient Greece like the agora.”

But librarians did not always completely understand architectural concepts, according to architects. One architect, who had worked on more than 10 academic and public library designs, commented on discussing design possibilities with librarians:

*A lot of times librarians have certain things in mind, such as, their design priorities they've read about, like flexible space, way-finding, and accessibility. Librarians know these words, and then they say, "We need them." But, unless they really understand what it is they've asked for, they don't necessarily know what they're asking from us as architects. It's kind of like the person who wants a house, and says to an architect, "I want a Georgian Revival." Well, do they know what a Georgian Revival really looks like? And why do they want it?*

At the same time, architects said they struggled with understanding discussions about the “digital side” of libraries. Architects said that in retrospect, they needed a better grasp of technological issues to keep up with librarians’ changing needs for users as well as the building infrastructure. These discussions, according to our interviews, were about replacing legacy systems in libraries, using cloud computing, or providing access to the physical collection via high-density storage systems.

A campus architect at a small university said:

*I wish I had known more about the whole idea of the way that devices are being used, platforms are being used, their inter-connectivity, and how this impacts the learning process, it's all evolving so quickly. How do you create a space that is nimble enough to be able to respond to these things as they change? We've been in our own profession long enough that we've already gone through re-learning what we do seven or eight times. Now, I find out I need to spend more time learning about the digital side of libraries, too.*

In a few cases, librarians said architectural firms brought in technology consultants in situations like this quote describes. Unfortunately, this addition was more of a hindrance to planning a building's technology infrastructure. In the end, librarians ended up clarifying what they needed from technology. As one of the librarians explained, "We needed to convince architects we need a design for the long term as learning styles change and a building that will be able to accommodate these changes by including things like ubiquitous power outlets and reinforced Wi-Fi."

### Metrics for Evaluation

In most cases, as soon as a library learning space project was completed, communication between librarians and architects ended. Very few librarians or architects in our sample conducted a systematic assessment of new spaces once they were occupied. Far fewer had metrics for assessing how new spaces facilitated student learning and users' productivity at accomplishing research tasks, which was a major goal of most library learning space projects.

Instead, most librarians in our sample said they based the success of projects on the "visibility and greater use of services." About a third said their primary metrics of success for library learning space projects were gate counts (36%), standard usage statistics (e.g., circulation figures or e-resource downloads) (36%), or surveys (32%).

**. . . most librarians in our sample said they based the success of projects on the "visibility and greater use of services."**

Architects in our sample also said they did very little post-occupancy evaluation. One architect said repeat business as well as gauging the "use of building" is how they measured success. About a third (32%) said they looked at usage statistics or gate counts as metrics for their own evaluation. As another architect, who had worked on a community college's library renovation, said:

*We established project goals that are measurable with the completion of the building. But formally, we didn't have any metrics or complete any post-occupancy evaluations. And, honestly, that's pretty typical. Unless you're trying to write a paper and need some data, we don't look at these measures. We always say we'd love to do more assessments, but the reality is they take more time and effort and by then you've already moved on to the next project. We want to know the project launched successfully now that they're occupying the building, so we're certainly there throughout that process. But there's no system in place to measure or track that.*

Notably, the measures frequently used, such as gate counts evaluated *physical presence* rather than users' success with learning and completing tasks. While surveys were mentioned as possible methods to use on future projects, methods like these had been rarely used on the projects we studied. The large majority of stakeholders said they did not have the time to develop such measures for the projects in our sample. The most frequently mentioned barriers to assessment were logistics, time, energy, expertise, and resources required to do evaluation.

Only a handful of librarians in the sample seemed driven to find out how library space was "really helping students." These librarians said they were just beginning to correlate the use of library spaces with GPA and student retention – whether students were coming back to the university after their first and second years.

### Concluding Thoughts

In the final sections of this report, we offer some actionable conclusions. In Figure 11 and Figure 12, which summarize the best – and worst – practices for planning and designing learning spaces in libraries. These practices draw from interviews with the librarians, architects, and library consultants in our sample. ❖

## Conclusion

In this report, we have shared expertise from key stakeholders about the future of libraries as part of the first PIL Practitioner Series report. We present these results at a time when academic libraries are undergoing tremendous change in response to evolving pedagogy practices in an increasingly connected world.

We interviewed 49 stakeholders – librarians, architects, and library consultants – at the forefront of 22 academic library learning space projects in the US and Canada. While our institutional sample is not generalizable to the entire population of academic libraries on campuses across the US and Canada, the findings from our in-depth interviews suggest these actionable conclusions:

1. **Need for more pre-design user studies.** Both librarians and architects placed a high premium on creating “user-centered” designs. Yet, we found the usage data they often relied on for space planning and decision-making was more anecdotal than based on empirical scientific evidence. Even though librarians’ first-hand observations of students use of library spaces have use, and were considered a “best practice” by architects in our sample, these insights are incomplete and limited for making planning and decisions. First, these data do not qualify as systematically gathering input from students. Second, when these measures were used in our study, they rarely considered faculty as end-users, and as intermediary users that define what students need to accomplish. Considering the cost, importance, and permanence of their planning and design decisions, librarians and architects need to conduct more rigorous pre-design user studies. Formal methods, such as large-scale surveys or in depth interviews, need to be used to gather user input directly from students as well as faculty for planning spaces. These data can also be a source of post-occupancy evaluation especially for showing how students and faculty use libraries differently once new spaces have been created.
 

**Considering the cost, importance, and permanence of their planning and design decisions, librarians and architects need to conduct more rigorous pre-design user studies.**
2. **Need for more post-occupancy studies.** Most stakeholders said they relied on standard metrics, such as gate and head counts, as measures of success once their library space project was completed. While these measures collect data about the *presence* of students in the library, they are as incomplete and limited as the anecdotal data that is used in the pre-design phase. What librarians and architects need to do in this case is to systematically measure how students’ learning needs or successes with learning are being impacted by the creation of new library learning spaces. But few established measures exist. This finding underscores the chasm between the need for creating improved learning spaces in academic libraries and the ability to assess how these spaces impact end-users’ successes with learning and completing necessary tasks. One way this gap can be closed is through more development of a priori evaluation metrics that link campus-wide learning outcomes to goals of the library space projects. This may be best done by academic library professions and through systematic studies with samples representing a range of library learning space projects, rather than just a single one.
3. **Need for more campus-wide integration in decision-making by library administrators.** It is essential that librarians are involved early on in campus-wide decision-making about the selection of learning partners with whom they will share space. We found, however, that most librarians we interviewed knew too little, too late. As a result, both planning and implementation suffered. Librarians need to be partners and collaborators in the library planning process from the outset. One solution is for library administrators to be well integrated in their campus decision-making bodies by serving on key institutional committees. They need to network with key decision-makers before there are any discussions of a library project. They also need to initiate and develop alliances with learning partners across campus, rather than being assigned. Moreover, they need a seat at the table so that learning partners are selected that strengthen the library mission to support student learning where the library is already strong.
4. **Embracing the originality of library learning space designs.** If we learned anything from the experts we interviewed, it was that one size does not fit all academic libraries; designs will, and should be, different on every campus. Moreover, the design of library learning spaces will continue to evolve for years

to come in response to seismic changes happening in pedagogy and curricular programs on campuses. This is why flexibility is an essential design element for academic library learning spaces. The goal for librarians and architects alike must be creating flexible spaces that are both “user-defined” for meeting students’ needs at a moment’s notice with moveable furnishings. They must also be prescient, so the evolving needs of users as well as the IT they depend on can be anticipated and accommodated 10 or even 20 years into the future.

Taken together, our findings suggest that the success of library projects depends upon a shared knowledge and understanding of the sweeping learning, pedagogical, and research changes facing the academy. Librarians and architects need to work together to apply that knowledge and understanding to the unique environment and learning and teaching needs of their specific institution.

Moreover, our findings suggest that library learning space projects are at the greatest risk of failure when librarians and architects neglect to gather input from all users. This is an essential part of any library project, yet it is often overlooked. We recommend that *all end-users* – students, faculty, librarians, library staff, and other members of the campus community – be engaged throughout the process, from planning and design to implementation and post-occupancy.

Time allotted for assessment as well as the necessary evaluation expertise needed must be built into projects so end-user input is systematically collected. Doing so establishes a critical sense of ownership for everyone who uses a new space. Only then can stakeholders begin to more deeply understand how the library learning spaces they have created support the teaching and learning goals of their unique campus.

### **Next Steps**

This report builds on our previous work on libraries and how the information and learning needs of college students are being served. Our next investigation at PIL will be a large-scale study of students’ uses of learning spaces.

In this future study, we pose two timely and crucial questions: How do students use the new learning spaces created for them in academic libraries, and how do they use other spaces – physical and virtual – in their lives? What research practices are today’s college students using for course-related research, and how do these practices support their academic learning? We will use a mixed-methods approach of student focus groups and a large-scale quantitative survey to answer these questions. ❖

## Best Practices

FIGURE 11: BEST PRACTICES FOR ACADEMIC LIBRARY LEARNING SPACE PROJECTS	As stated by stakeholders we interviewed:		
	LIBRARIANS	ARCHITECTS	CONSULTANTS
1. Talk to librarians, staff, student, and faculty so the design process is inclusive and there is a large amount of user input.	✓	✓	✓
2. Ask lots of questions during design discussions to make sure the opportunity for giving input is not missed.	✓	✓	✓
3. Hire experts to advise where there is a lack of expertise on a project (e.g., project managers, IT specialists, library consultants, civil engineers, and landscape architects).	✓	✓	
4. Be sure to document the planning and design process, so that decisions and outcomes can be revisited and verified.	✓	✓	
5. Develop and document the scope for a project early on; one that has goals that are realistic, affordable, and achievable.		✓	✓
6. Ensure there is a shared vision for a design across all library units before renovation or building of a new structure begins.	✓		✓
7. Hold frequent check-in meetings with individual library units (e.g., circulation or reference) and also bring everyone together in library-wide meetings.	✓		
8. Tour other campus libraries (and new learning spaces) to find out what design worked well, and what did not.	✓		
9. Find champions within the faculty to communicate the value of project, since faculty often needs to be convinced how new spaces will impact their research and teaching.	✓		✓
10. Have continuous communication with campus constituents about the project's progress. Use different channels (e.g., web, social media, in person presentations given at request of departments).	✓		
11. Trust the architectural design process; it's intentionally slow so there is a greater sense of ownership for a project as it develops.		✓	
12. Conduct continual user assessments of what needs are (and are not) being met. Modify design goals to resolve problems.	✓		
13. Create and sign a Memo of Understanding (MOU) between the library and learning partners, especially when partners are contributing funds for space in the library.	✓		
14. Make sure the architectural firm and the construction company has an integrated process for the construction phase of library spaces.	✓		
15. Provide a translation session between librarians and architects to define architectural vocabulary to help manage expectations.	✓		
16. Good lighting and the proper acoustic treatment are necessary to the success of library projects.		✓	
17. Anticipate change 10 years from now, so that spaces can expand and contract as needed. Plan for flexible designs.		✓	✓

Ordered from most to least mentioned best practices in interviewees' discussions about their projects. N= 49 stakeholders, N = 22 academic library learning space projects. Some of the best practices listed may be additional to the themes discussed in the Detailed Findings section of this report.

## Worst Practices

FIGURE 12: WORST PRACTICES FOR ACADEMIC LIBRARY LEARNING SPACE PROJECTS	As stated by stakeholders we interviewed:		
	LIBRARIANS	ARCHITECTS	CONSULTANTS
1. Working as a small insular group that creates a plan and design without including input from anyone else on campus.	✓	✓	✓
2. Getting embroiled in territorial battles and clashes with library learning space partners over shared space needs and furnishings.	✓		
3. Having poor communication with faculty (e.g., when trying to make decisions about downsizing the collection, or visioning active learning classroom spaces).	✓		
4. Losing sight of the “big picture” for a project due to drawn out timelines, lack of funding, or planning before the money is secured.	✓		✓
5. Working from a timetable that is unrealistic, such as weeding of the collection goes too fast and the construction goes too slow.	✓		
6. Forgetting to pilot test new services and arrangements with new partners prior to construction to see how, and if, they will work.	✓		✓
7. Leaving out maintenance staff in early discussions to figure out what is needed to maintain spaces that are being built.	✓	✓	
8. Having no transparency with staff about the design process, especially about upper level decisions made without staff buy-in.	✓		
9. Being at the whim of a slow approval process when seeking administrative level buy-in for design plans.	✓		
10. Hiring architects that do not “walk a space” they intend to design, but rely on design discussions to understand space usage.	✓		
11. Hiring architects that assume they know what's best for clients.		✓	
12. Allowing stakeholders to approach a project with their own agendas and resistance to collaboration.	✓		✓
13. Allowing oneself to be seduced by the organizational chart can result in losing important input – and the “pulse” – for the project.		✓	
14. Suffering from project fatigue, especially at the end of a project, and not doing a continual and careful review of design and solicit final reviews by multiple stakeholders.	✓		
15. Not limiting the formation of “too large” design committees, which result in some people showing up at one meeting, and not the next, which, in the end, makes consensus nearly impossible.		✓	
16. Choosing built-in furniture that can't be easily changed, or letting architects dictate custom-made furniture that is not easily replaced.	✓		
17. Ignoring, or not listening to, what clients want and need from library learning space design at the initial information-gathering stage.		✓	

Ordered from most to least mentioned worst practices in interviewees' discussions about their projects. N= 49 stakeholders, N = 22 academic library learning space projects. Some of the worst practices listed may be additional to the themes discussed in the Detailed Findings section of this report.

## Further Readings

- Bailey, D. R., & Tierney, B. (2008). *Transforming library service through information commons: Case studies for the digital age*. Chicago, IL: American Library Association.  
A guide to best practices and critical design considerations for librarians building information commons. Includes 20 case studies of information commons in large and small academic libraries.
- Beagle, D. R., Bailey, D. R., & Tierney, B. (2006). *The information commons handbook*. New York, NY: Neal-Schuman Publishers.  
A comprehensive guide to building information commons in libraries, including details on space planning, staff training, evaluation, and marketing.
- Bennett, S. (2007). First questions for designing higher education learning spaces. *The Journal of Academic Librarianship*, 33(1), 14–26.  
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Results from a survey of 118 institutions and 400 librarians are presented by an architectural design firm that conducted the study. Results indicate that successful design projects are unique to each institution and closely follow the pre-established master plan while anticipating future changes and needs.

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- Lippincott, J. K. (2012). Information commons: Meeting Millennials' needs. *Journal of Library Administration*, 52(6–7), 538–548. <https://doi.org/10.1080/01930826.2012.707950>  
A discussion of how to meet the academic library needs of "Millennial" students. Recommendations are included for how librarians can create learning commons where combined service spaces are integrated to assist students who might be reluctant to ask for help.
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Strategies for developing and strengthening collaborative partnerships between librarians and stakeholders are provided. Examples of building projects using cooperative, participatory, or contextual design methodologies are included.
- Yoo-Lee, E., Heon Lee, T., & Velez, L. (2013). Planning library spaces and services for Millennials: An evidence-based approach. *Library Management*, 34(6/7), 498–511. <https://doi.org/10.1108/LM-08-2012-0049>  
Survey results are presented from a sample of North Carolina State University (NCSU) undergraduate students (N = 100) on perceptions of social and communal library spaces. Findings suggest that students desire social spaces to support both collaborative and individual study needs.



## Methodology

Data in this report were drawn from qualitative interviews with 49 stakeholders who served on one of the same 22 academic library learning space projects in our institutional sample at community colleges and four-year public and private colleges and universities in the US and Canada. Projects occurred between the years of 2011 and 2016. Most, though not all of the projects, had been completed at the time of the interviews.

PIL researchers conducted audiotaped interviews with study participants between May 24, 2016, and June 22, 2016. Each interview lasted between 35 and 60 minutes. PIL interviewers asked 11 open-ended questions about planning and designing the library learning space that was the subject of the interview. (See the end of this Methodology Section for the interview script.)

Interviewees were asked to discuss: (1) descriptions of academic library learning space they had worked on and that was in our institutional sample, (2) design priorities, given their professional provenance and preferences, (3) data collected about users at different stages of a project, (4) methods of collecting user input as well as post-occupancy evaluation metrics used, and (5) best (and worst) practices associated with projects that were the topic of the interviews.

Prior to any data collection for this study, we prepared and submitted a research protocol to the Institutional Review Board (IRB) at the University of Washington, where the study was funded with a Strategic Research Grant from the Information School.<sup>35</sup>

Five PIL researchers conducted the interviews. Pre-tests were conducted with two librarians at different institutions. These pilot test participants had deep familiarity and experience in academic libraries and with library learning space projects. After the pre-test phase, interviewers made minor suggestions to improve the wording of the interview script, which were all adapted.

### Interview Participants

Study participants were recruited from the American Library Association's (ALA) Information Literacy listserv and through recommendations. Library consultants and librarians in the PIL Volunteer Sample also suggested well-known projects, which they had not directly worked on, but had toured.

The interview sample was limited to participants who qualified as *key stakeholders*. We defined these stakeholders as librarians, architects, or library consultants in decision-making positions and at the forefront of one of the same 22 library learning space projects in our sample. The institutional breakdown for these projects was as follows: four community colleges (18%), 11 public universities (50%), and seven private colleges and universities (32%).

The interview sample was made up of 22 librarians, 22 architects, and five library consultants. As part of the interviews, quantitative data was collected from each participant about his or her years in a profession, number of library learning space projects completed, years of employment, title, and highest level of education (Figure 13).

Most of the interviewees were seasoned professionals. Eighty-six percent had worked in either librarianship or architecture for more than 15 years. As a whole, more than a third (35%) of the interviewees had been at their current place of employment from three to eight years. Almost half the sample had worked on seven or more library learning space projects in their careers.

The sample was skewed with far more female (69%) than male (39%) interview participants in all of the stakeholder categories. This is unsurprising for the library field, since the profession has far more women (60%) than men (40%) in leadership roles (e.g., directorships or deans), according to the Association of Research Survey, 2009 – 2010. What was unusual about our interview sample was almost as many architects were females (45%) as were males (55%). This is much higher than the 2014 National Bureau of Labor Statistics' latest figures. The percentage of female architects in the US is only 26%.<sup>36</sup>

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<sup>35</sup> The protocol was approved on April 22, 2016 University of Washington Human Subjects approval #51845.

<sup>36</sup> Pogrebin, R. For Female Architects, Many Hurdles in the Way. *New York Times*, April 13, 2016, C1.

**Figure 13: Interview Sample Demographics**

	LIBRARIANS	ARCHITECTS	CONSULTANTS
<b>Years worked in their profession</b>			
More than 15 years	19 86%	19 86%	4 80%
10 – 15 years	2 9%	1 5%	0 ---
5 to 9 years	1 5%	2 9%	0 ---
Less than 5 years	0 ---	0 ---	1 20%
Total responses	22 100%	22 100%	5 100%
<b>Number of library learning space projects worked on</b>			
More than 10 projects	0 ---	5 23%	4 80%
7 to 10 projects	4 18%	9 41%	1 20%
3 to 6 projects	11 50%	3 14%	0 ---
1 to 2 projects	7 32%	5 23%	0 ---
Total responses	22 100%	22 100%	5 100%
<b>Length of time at current place of employment</b>			
More than 15 years	7 32%	7 32%	3 60%
9 to 14 years	5 23%	4 18%	0 ---
3 to 8 years	8 36%	8 36%	1 20%
1 to 2 years	1 5%	1 5%	0 ---
Less than a year	1 5%	2 9%	1 20%
Total responses	22 100%	22 100%	5 100%
<b>Highest level of education</b>			
Doctorate	4 18%	0 ---	0 ---
Masters	18 82%	14 64%	3 60%
Bachelors	0 ---	8 36%	2 40%
Total responses	22 100%	22 100%	5 100%
<b>Gender</b>			
Female	19 86%	12 55%	3 60%
Male	3 14%	10 45%	2 40%
Total responses	22 100%	22 100%	5 100%

## **Coding Procedures**

Manifest coding methods were used for analytic reduction and a systematic interpretation of underlying patterns in the interview logs. Krippendorff's alpha (KALPHA), the most rigorous means of testing intercoder reliability, was run on the pilot test round of interviews coded by two PIL researchers. KALPHA takes into account chance agreement among content analysis coders.

There is no universally accepted standard for intercoder reliability using Krippendorff's alpha. Yet communications researchers have suggested that a coefficient between 0.81 and 0.99 is "almost perfect," between 0.61 and 0.80 is "substantial," and 0.41 to 0.60 is "moderate."

Two pilot coding rounds of three interview logs each were used. During the second pilot round, the coding practices reached the acceptable reliability level of 0.84. Thereafter, we coded the interview logs using individual properties, i.e., learning activities new spaces were intended to support, adjectives used to describe design elements, design components used in spaces, learning partners in tutoring spaces, methods for collecting user data, methods for evaluation measures, and best practices.

## **Methodological Limitations**

There are challenges associated with the use of interviews in research. For instance, collecting data with interview methodologies depends on participants' provision of accurate and complete answers. Accordingly, the interviewer must endeavor to establish trust and rapport while keeping track of the responses.

Bias on both sides of this kind of exchange is always a formidable issue. Bias can be readily introduced in the way the interviewer frames a question, or the way in which a respondent interprets and then answers a question. To enhance the reliability of our interview technique and the consistency of the questions we asked, we used a scripted interview with study participants. The script was piloted and a few small changes were made to the wording before the interviews began.

Another issue is the generalizability of the data collected from qualitative interviews. When considering these limitations, we point to the main purpose of qualitative research: interviews are not necessarily used to produce generalizable findings about a sample. Rather, interviews are used to arrive at a deep understanding of a specific situation, such as making planning and design decisions about academic library learning spaces, as respondents decide to report them.

Despite making every attempt to compensate for the limitations of our study methodologies, we acknowledge that future research is required to confirm our findings. Therefore, our findings should not be viewed as comprehensive, but as part of our ongoing research about libraries as learning places.

## **Interview Script**

To more deeply understand the changes occurring in library space today, we are conducting these interviews for a study. We are interviewing architects, planning consultants, and librarians who have played a pivotal role as a project lead or manager on the same recent library design project. This project can be large or small, ranging from building entirely new library buildings to renovating existing space to create additional space for maker spaces or learning commons.

CODING: Numeric code for name of library project, the interviewee type, your initials, and date of your interview:

\_\_\_\_\_

Question 1.

Let's start with you telling me a little about the library learning space that we're here to discuss today. Can you describe what kind of library space building project that you worked on at \_\_\_\_\_ (name of institution here). Would you say that this library space project was a learning space project? If so, what kind of learning did it support and how?

Probe 1.1: Now, let's shift topics a little bit and talk about your profession. It seems that the people in your field bring a set of values to certain tasks, however big or small those tasks might be.

Can you give me an example of how your field's professional values came into play when you were making decisions for your library space project (as the interviewer, you can mention the name of the library project here)?

Probe 1.2: Would you say there were differences between the professional values that architects vs. librarians brought to this library space project? If so, what would you say are the three biggest differences? How were these differences resolved, if at all?

Question 2.

Let's talk about the planning and design of this library learning space project that you recently worked on. What were your design priorities? What came first, above everything else, when you got down to planning a new space? Can you give me an example?

Probe 2.1: How do users fit into the planning and design process?

Probe 2.2: Did you and your colleagues use any measures of success for evaluating the success of the project?

Probe 2.3: What did these measures tell you? What did you wish you still could learn about the success of the project? Were you satisfied with what you learned from these measures? If there were no measures of success, why not?

Question 3.

Given your experience, were there any best practices that you used on this library learning space project? If so, what was the most important best practice that you used?

Probe 3.1: Is there such a thing as "worst practices?" If a library learning space project is going to go awry, when does it tend to happen and how? Did your project have any "worst practices"?

CONCLUSION AND DEBRIEF

Inform the interview participant of privacy and confidentiality measures. Inform the participant that findings will be reported in a synthesized format, descriptive of the sample as a whole, and posted on the University of Washington Information School's and PIL's website in the fall of 2016. ❖

## Acknowledgements

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— Alison J. Head  
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