



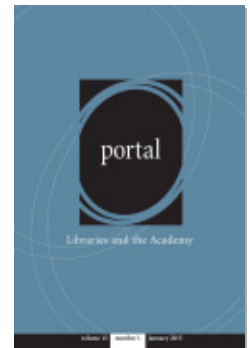
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Libraries and Learning: A History of Paradigm Change¹

Scott Bennett

abstract: The transformation of information from a scarce to a superabundant commodity has driven three paradigms in the design of library space. These are the reader-centered, book-centered, and learning-centered paradigms. The first two competed inconclusively with one another throughout most of the twentieth century. Revolutionary changes in information technology have only recently made a third design paradigm possible, one focused on intentional (or autonomous) learning. This paradigm frees us from a schoolwork approach to learning and from mere trafficking of information. The challenge before us is to align library space design with the transformational character of intentional learning.

From the beginning, libraries and learning have been inseparable. The libraries at the Nippur temple and at Aristotle's Peripatetic School, the Alexandrian Library, the libraries at the Persian Academy of Gundishapur, at the Grand Umayyad Mosque at Aleppo, and at Benedictine and other monasteries, the Medicean-Laurentian Library in Florence, the Bodleian Library at Oxford, and the libraries at every college and university worldwide—in all these times and places, libraries have been integral to learning.

For virtually all of this four thousand-year history, books were scarce, highly prized, and closely guarded. Their creation and reproduction were labor-intensive enterprises on which wealth and artistic skill were often lavished. In the West, this began to change with the introduction of moveable type in the fifteenth century; but, because of the high cost of paper, books remained luxury items through the eighteenth century. With the invention of the Fourdrinier machine in 1807, mass-produced paper started to become relatively inexpensive and arguably the chief industrial product of the nineteenth century.² Books, magazines, and newspapers became much less expensive and much more abundant throughout the nineteenth and twentieth centuries.³ A twentieth-century technological revolution, introduced by the computer chip driving relatively inexpensive personal computers and worldwide telecommunication systems, has now



made information superabundant. For the first time in human history, information is not a scarce commodity. Each of these three revolutions in information technology—moveable type, the paper-making machine, and the computer chip—strongly advanced the democratization of knowledge.

My purpose is not to chronicle the technology-driven changes that have redefined our societies but more modestly to trace three paradigms in the design of library space

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that reflect the transformation of information from a scarce to a superabundant commodity. All three continue to exert strong influence on our thinking about library space. I name these the reader-centered, the book-centered, and the learning-centered paradigms of library space design. I sketch the long and rich history of the first two quite briefly so as to give

most attention to the third, which is the product of the current revolution in information technology. I exemplify all three paradigms with library buildings at institutions where I have worked.

Reader-Centered Paradigm

In the first of these paradigms, books are decisively in the service of readers. In the Western world, this paradigm of library space design springs from the monastic scriptorium and library. The defining feature of a monastery was its cloisters, the space set apart for secluded prayer and reflection and for access to the scriptorium and library. Contemplative and library space are closely interconnected. Because books were few and precious, the space was designed primarily for readers—typically a reading lectern or carrel for the monk, placed perpendicular to a window for the sake of light.

This design paradigm has been extraordinarily strong. As late as the 1920s, when James Gamble Rogers was designing Yale's magnificent Sterling Memorial Library, he used the Gothic church as his design idiom. Immediately adjacent to the nave-like entrance to Sterling is a large courtyard, on two sides of which are walls with large windows illuminating small bays for reading. This focus on readers is reinforced by a set of reading rooms opening off the nave, rooms dominated by light and reading tables, not by books (see figure 1).

Where Sterling Memorial Library echoes the monastery with extravagant splendor, it was with a restrained Georgian design proclaiming Enlightenment values that The Johns Hopkins University built Gilman Hall, the home of its humanities departments and of the library supporting their work. Here again, the idea was to make the most immediate connection possible between readers and books. The architectural idiom was as different as possible from a monastery, but the building bespoke the same purpose. Gilman's "core was a system of central stacks. ... Gilman was designed to sustain scholarship. It had everything a man of letters—they were all men in the early days—needed for his work: offices, classrooms, seminar rooms, and books (see figure 2)."⁴

The idea that books should be at the heart of scholarly endeavor also informs the idea of the departmental library in larger colleges and universities. In my own experi-

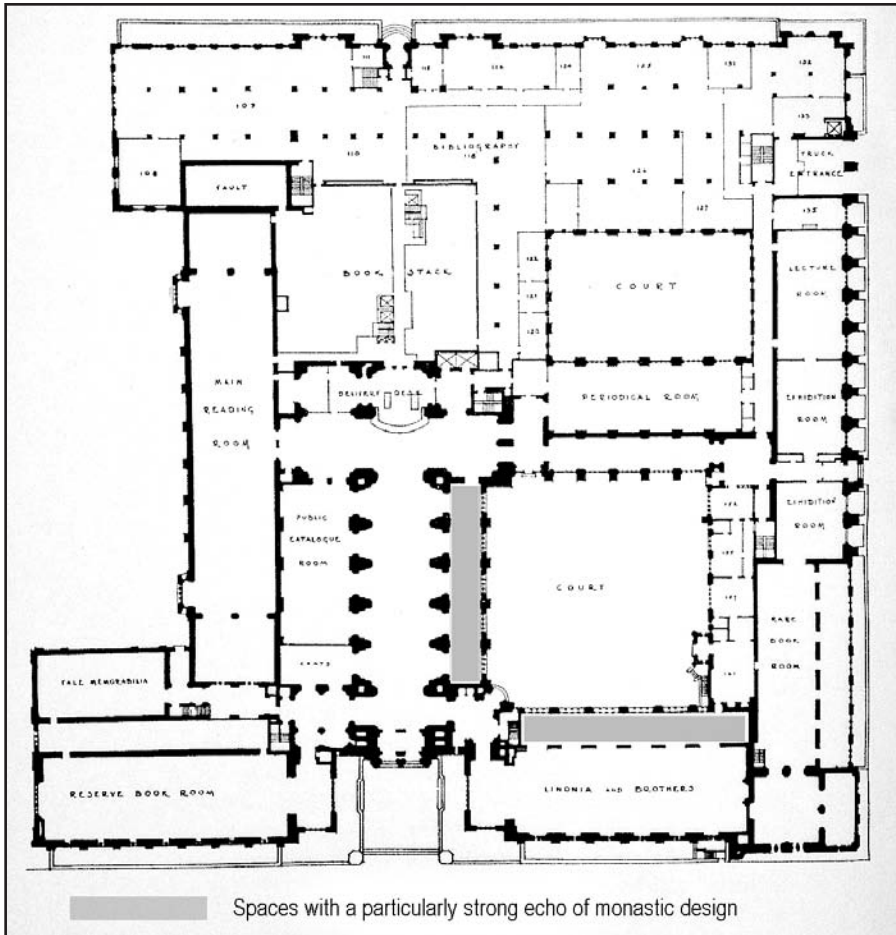


Figure 1: Entry Floor of Sterling Memorial Library, Yale University
 Floor plan from *The Yale University Library Gazette* 5, 4 (April 1931): 60

ence, mathematics faculty members have believed tenaciously that their journals and books must be located in the closest possible proximity to their offices and classrooms. At both Northwestern University and the University of Illinois at Urbana–Champaign, this resulted in the conversion of what had once been the universities’ main libraries—Lunt Hall and Altgeld Hall, respectively—into mathematics libraries.

Lunt Hall, a Beaux Arts design, opened in 1894 and became a departmental library in 1950. The Romanesque Altgeld Hall opened in 1897 and became a departmental library in 1927. The Georgian Gilman Hall opened in 1916, whereas the academic Gothic Sterling Memorial Library was dedicated in 1931. As different as these buildings are in their outward and most obvious design idioms, they all were, nonetheless, designed or came to be used with the purpose of affirming the unity of readers and books.

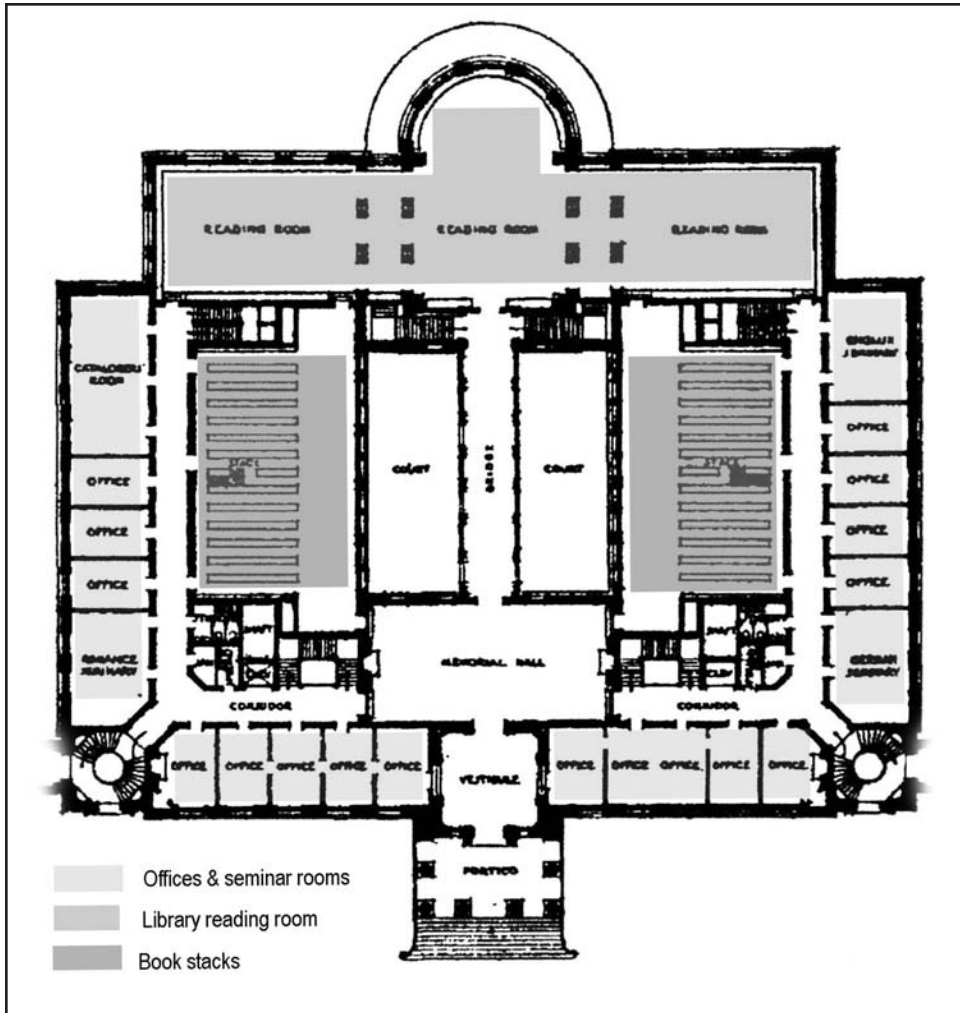


Figure 2: Entry Floor of Gilman Hall, The Johns Hopkins University
 Floor plan from M. Llewellyn Raney, "The Academic Building [i.e. Gilman Hall]"
 The Johns Hopkins University *Circulars* 35 (1916): 1273; courtesy of The Ferdinand Hamburger
 Archives of The Johns Hopkins University, Record Group Number 10.030

Book-Centered Paradigm

Gilman Hall opened in 1916 with a collection of just under 200,000 volumes distributed over three floors of book stacks, faculty offices, classrooms, and seminar rooms. By 1941, Gilman held just over 535,000 volumes and could hold no more. Alternatives had to be found, but faculty members strongly resisted changes to a design that was so well suited to the particular character of teaching, learning, and scholarship at Johns Hopkins. Collection growth ultimately forced the issue, with the ensuing decision to build the Milton S. Eisenhower Library. The new library opened in 1964 with just over 1.1 million volumes, about six times the number of books with which Gilman opened



not quite 50 years earlier.⁵ The new building had five and a half floors, four of them almost entirely given over to shelving the collections; books, not readers, were regnant in the new library.

This allocation of space signals the defining characteristic of a second paradigm for the design of academic libraries—the shelving of large collections. Throughout the nineteenth century, most academic library collections were comparatively small. They could often be accommodated in a single room or set of rooms in buildings with other academic purposes. Libraries built as late as the 1890s were, like those in Lunt and Altgeld Halls, dominated by reader spaces, not by shelving.⁶ But the explosion of paper-based publications in the nineteenth century caught up with academic libraries, making Lunt, Altgeld, and Gilman obsolete within just a single generation. These libraries did not need simply to be redesigned; and, in the case of Gilman, the library could not be redesigned or expanded. A new paradigm was needed, one that would accommodate large and growing collections.⁷

The imperatives of this new book-centered paradigm are perhaps nowhere more sharply evident than in the building that replaced Altgeld Hall at the University of Illinois. Construction of a new main library began in 1923; the building was first occupied in 1926 and completed in 1927, just 30 years after Altgeld Hall had opened. Additional book stacks at the west end of the building were part of the original plan and were completed in 1939. The unrelenting need for more shelving drove the construction of additional book stacks in 1958, in 1968, and in 1982 (see figure 3). The 1982 addition maximized its holding capacity through the use of high-capacity moveable shelving. The library building finally stopped its westward expansion not by slowing the growth of its collections but by opening a separate high-capacity shelving facility at the edge of campus in 2004. The second module of this facility was completed in 2008.

Book space, not reader space, came to dominate this library over a period of just 50 years. Although this change may be most evident in research libraries, with their exceptionally large collections, it was in fact characteristic of academic libraries of all sizes, which saw over time an apparently unavoidable displacement of readers by books. A building type once thought to bring readers and books together was now less and less congenial to readers as books took over the space. The history of academic libraries in the twentieth century can be written in terms of the rate at which books drove readers out and of the Sisyphean efforts of institutions to escape this trend. This dominance of books over readers appeared in a survey of academic library projects completed between 1992 and 2001, in which library directors were asked what motivated new capital investment in library space. By far the single most frequent motivator (in 57 percent of the 240 responses) was the need to accommodate collection growth.⁸

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Information Technology and the End of the Book-Centered Paradigm

But change was afoot. Notably, in follow-up interviews with those associated with library projects completed between 1992 and 2001, most library directors “expressed

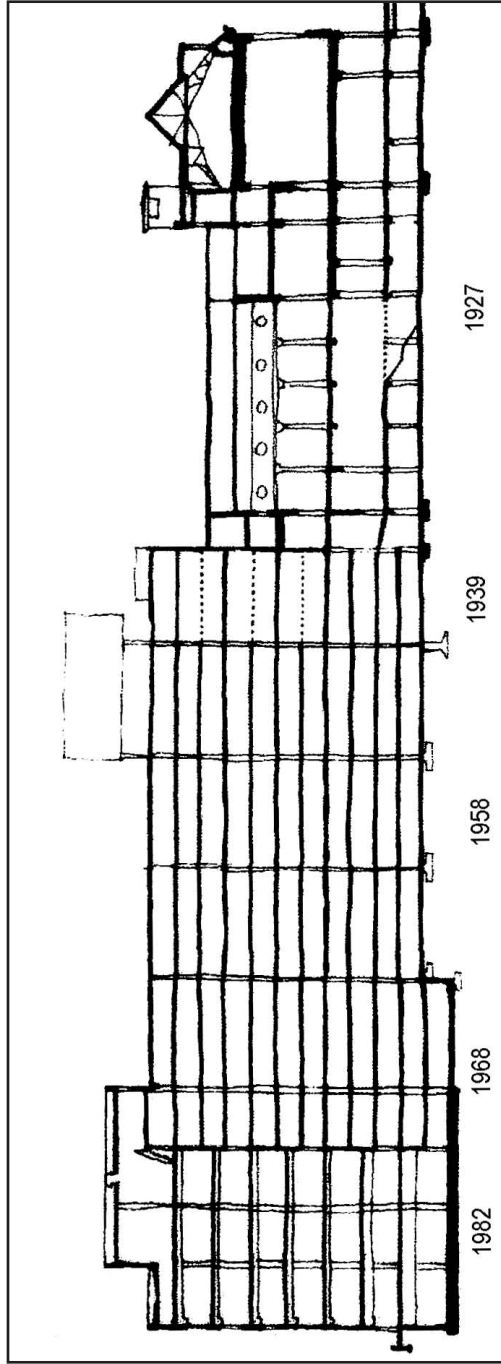


Figure 3: Main Library, University of Illinois at Urbana-Champaign Stack Additions, 1939–1982 Building section from “Conceptual Framework Report, Main Library, Executive Summary,” Shepley, Bullfinch, Richardson, & Abbott (2006), 9. Used with the permission.



little anxiety about future shelving needs. ...Many felt that—with burgeoning online resources and off-site shelving facilities a possibility—it was unlikely that shelving needs would ever again drive library space design in the way it had in the past.”⁹ One liberal arts dean countered this optimism by observing that “one of the things that happened when we got done with the renovation and expansion is that the space got so much more attractive that the number of visitors [i.e., readers] simply doubled or tripled. ...And so the question is, can the library if it gets significantly more full [with print material] still accommodate that number of students? And it will be difficult.”¹⁰ This chief academic officer could imagine a future when his college would once more treat shelving the collections as the primary function of the library building, in time driving readers back out of the building.

These two views dramatize the conflict between the first and second design paradigms of library space—between library designs in which readers are dominant and those in which books are the dominant consideration. These two views pose the question of how long the second, book-centered design paradigm would prevail into the twenty-first century.

The end of that paradigm may have been signaled in a 1993 meeting of the board of trustees at Denison University. Given the severely over-crowded condition of the library’s book stacks, President Michele Myers asked the trustees to approve a substantial expansion of the library. One of the trustees, William Bowen, then president of the Andrew W. Mellon Foundation, was profoundly uneasy with this approach. He wondered whether its driving force, the seemingly ineluctable growth of the print collections, might be changed. From this uneasiness grew JSTOR, now an immensely important online source of journal back files.¹¹ One measure of the success of this digital publishing project is that by 2002, less than a decade later, library directors “regularly commented on their newly acquired ability to remove back files of journals from prime shelving space or from the collections altogether.”¹²

Bowen is an economist; his aim was to avoid unnecessary spending on library space, not to create a new paradigm of library space design. But by easing the stranglehold of the book-centered paradigm, he and others who led the shift of collection growth out of physical space and into virtual space, in effect, opened the possibility of a new paradigm for library space planning.

If library planning might now be driven primarily by something other than the need for additional shelving, what would it be? The 2002 survey found that the second most frequent motivator for new library space was the changing character of the space needed for student study (45 percent of the responses, as compared to 57 percent for growth of the collections). Might a new paradigm focus on this need? Might learning be the primary motivator for a third paradigm of library space planning?

Learning-Centered Paradigm

Putting the learner at the center of library space planning is a return to the first paradigm, with the critical differences that information is now superabundant rather than scarce and now increasingly resident in virtual rather than in physical space. The first paradigm of library design brought the reader and printed material together in a par-



ticular physical space. But once every space is potentially a library space—that is to say, an information-rich space—the design challenge is less with the interaction of readers and books and more with the connection between space and learning.¹³

How has library space design dealt with this challenge? One important response was taking shape at much the same time as JSTOR was being created. Starting in the early 1990s with the Information Arcade at the University of Iowa and the Leavey Library at the University of Southern California,¹⁴ librarians and information technologists joined forces in designing a new set of services meant to respond to the revolution in information technology. This approach, embodied in what is now called the information commons, sees rapid and fundamental change in information technology as primarily a service and pedagogical problem. Students and faculty need well-equipped facilities and instructional help in mastering information technology. The information commons offers both and represents a new element in the traditional panoply of library service spaces—reference, circulation, technical services, and departmental libraries. The information commons requires a fundamentally new degree of collaboration between librarians and information technologists, who bring different professional training and cultures together in newly designed spaces in support of student and faculty learning. The information commons is now a well-established feature of library space design and has spawned its own professional literature.¹⁵

Another approach is evident in the Vogel Library, completed in 1999 at Wartburg College. The Vogel Library includes an information commons, but the library's design had a quite different genesis. Jill Gremmels, then director of the Vogel Library, argues that

libraries have tried to support learning, but I don't think libraries have traditionally said, "We want to make learning happen here." ...We didn't start out [our library planning] with what I think is the traditional question, "How much stuff do we have to get in this building and what kind of stuff is it?" ...We started out the planning by saying, "What do we want to happen in this building?" And the answer to that was that we wanted to be much more proactive about promoting learning.¹⁶

What resulted from the wish "to make learning happen" was a library on three floors, with virtually all of its books held in compact shelving on the entry floor next to the

If we want to make learning the central concern of library design, we are obligated to develop some understanding of the process of learning.

current periodicals, a curriculum collection, and a café. Reference services, an array of computers, classrooms, and staff offices occupy the second floor. A third floor is entirely devoted (except for the college archives and a student services office) to a variety of learning spaces, with *no* print library materials and *no* library or information technology staff present (see figure 4). This design, especially in its refusal to allow books to dominate the space and its third floor focused

almost exclusively on student learning, is a radical departure from the book-centered paradigm of library design.¹⁷

If we want to join Jill Gremmels in making learning happen in libraries, if we want to make learning the central concern of library design, we are obligated to develop

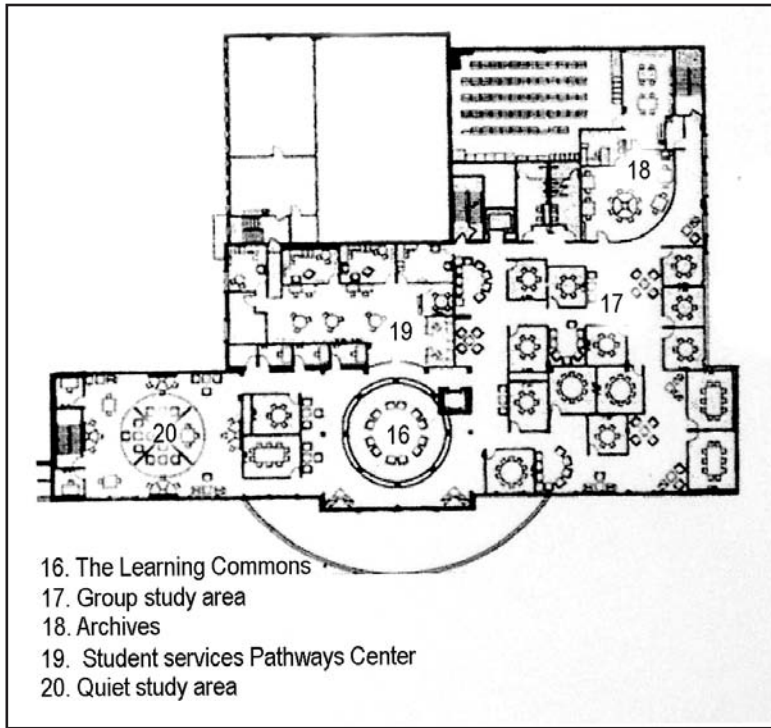


Figure 4: Third Floor, Vogel Library, Wartburg College
Floor plan from the Vogel Library Web site
Used with the library's permission.

some understanding of the process of learning. To do this, we might think of learning as involving four distinctive stages happening in a variety of spaces and realized through two quite different modes, as represented in figure 5. Within this framework, the key question is how to design space that helps prompt the second-stage decision by which a learner takes responsibility for and control over his or her own learning. Acting on this question can produce a third design paradigm that strongly aligns the library with the shift toward the learner-centered pedagogies that are transforming higher education.¹⁸

Figure 5 argues that classrooms are vitally important in launching learning. But the instructor remains in control of classroom learning, which makes the second of the four stages described here the first opportunity the learner has for taking responsibility for and control over his or her own learning. This second stage can be thought of as a “magical moment” in learning. There is no way to force this moment into being. It happens when the learner decides that a particular learning activity is intrinsically important and one way to shape knowledge, personal character, values, and a way of living. It happens when study becomes learning.¹⁹ Another way to characterize this transformative stage is to observe that, in the absence of taking responsibility for and control over one's own learning, one can be a history major but not a historian. Even more clearly, it is impossible to become a musician without taking ownership of the discipline and skills needed to play the piano, oboe, or other instrument.

Figure 5.
Four Stages In Learning

Stage	Typical campus learning space	Schoolwork	Intentional learning
1. Launch of learning	Classroom	Exposition of subject content (often in lectures); setting assignments focused on mastering this content	Conceptual framing of subject (i.e., what problems does the discipline address; what language does it use; what methods of inquiry are employed); setting assignments focused on an active engagement with these concepts
2. Responsibility decision	Library, laboratories, studios, computer laboratories, other "informal" learning spaces, residence halls, etc.	Learners take responsibility for completing assignments; learning is task-oriented and governed by the instructor. Depending primarily on the nature of the task, the student may or may not seek further instruction and/or services that support the completion of learning tasks	Learners take ownership of and responsibility for their own learning; seeking further instruction (e.g., tutoring) or services (e.g., reference assistance) may or may not happen and is motivated primarily by the ownership decision made by the learner.
3. Product	Library, laboratories, studios, computer laboratories, other "informal" learning	Work (e.g., a paper) that gives evidence of knowledge and is created for judgment by the instructor, with the primary purpose of earning a grade/credit/credential	Work (e.g., paper) that gives evidence of learning and is created with dual purposes: to learn from instructor's judgment of the work and to make the work a building block for the learner's own construction of character, values,



spaces, residence halls, etc.	and way of living. Earning a grade/credit/credential remains important but is secondary to the wish to live an informed life.
4. Outcome	A life-long learner who remains in some measure dependent on instruction/ services *

* A common example of such dependency might be the highly paid professional—such as a doctor or a lawyer—who has taken ownership of some discipline but believes it is not a productive use of his or her time to take ownership of certain writing or information seeking skills and who therefore depends on, say, technical writers and corporate librarians.



Scholars describe this transformative moment in learning in a number of ways. Phil Race puts the individual's *wanting* to learn at the center of a set of five interacting factors that underpin successful learning.²⁰ The editors of the landmark survey *How People Learn* use the term *metacognition* to designate a set of activities through which a person becomes a self-conscious and self-regulating learner. These activities include "the ability to orchestrate one's learning: to plan, monitor success, and correct errors when appropriate—all necessary for effective intentional learning."²¹ The term *intentional learning*, as developed by Carl Bereiter and Marlene Scardamalia, is particularly instructive. They use intentional learning to refer to "cognitive processes that have learning as [an intrinsic] goal rather than an incidental outcome," and they describe how all too often learning, instead, remains process-driven and degenerates into schoolwork. Speaking of primary school students, they argue:

The work that characterizes classroom life may have originally been conceived with learning goals in mind, and it may even achieve some learning objectives, but from the standpoint of students, doing schoolwork is what is school is about. It is their job, not attaining learning goals. ...We could find nothing in [children's talk about their classrooms]...to suggest that the children thought of themselves as learners. ...By interpreting learning activities as jobs to be done, students not only concretize them but assimilate them to the rich knowledge structure that surrounds work in industrialized societies. Even young children know something about what it means to have a job, to be a good worker, to take pride in a job well done, and so on. All this knowledge can immediately be brought to bear on schoolwork, making what might otherwise be an incomprehensible enterprise something easy to understand and adjust to. The drawback, however, is that schoolwork rather than learning becomes the object of effort.²²

To escape being trapped by schoolwork, Bereiter and Scardamalia argue that "students need to direct mental effort to goals over and above those implicit in the school activities."²³ These goals include building a problem-solving framework for approaching learning, taking responsibility for high-level skills normally exercised by the teacher, setting personally meaningful learning goals that subsume (and therefore satisfy) externally imposed schoolwork goals, and self-assessing their own success in learning.²⁴ To act successfully on such goals is to become an autonomous learner.

The first concern of a learning-centered design practice will be to create spaces that foster intentional learning. In the twenty-first century, we need constantly to affirm that the most important educational function of physical library space is to foster a culture of intentional learning. We must show how the library building is—or can become—a major factor in the transformational trajectory of such learning.

How often do we actually do this? One might paraphrase Bereiter and Scardamalia to say that, although we may often begin our planning with learning goals in mind and may even achieve some learning objectives, the accommodation and delivery of services is what the design of most library space is about. Group study spaces, cafés, computer laboratories, and information or learning commons are common features in contemporary library design. They all offer possibilities for intentional learning, and their design may be driven by learner-centered concerns. But intentional or autonomous learning has rarely been a planning goal. With the possible exception of group study spaces, none of these spaces inherently demands a learner-centered design practice. Space for learn-



ing frequently devolves into space for service.²⁵ The predictable result has been design decisions that most strongly support an instructor/service or a schoolwork-centered mode of learning—evident, for instance, in the inclusion of electronic classrooms in new library space.

Bereiter and Scardamalia conclude by saying that a list of the various factors that constitute intentional learning fails “to convey the sense of a whole educational environment geared to the pursuit of learning goals.” They reference, instead, the community of scholars, in which “the degeneration of knowledge building into schoolwork or other routines, although it inevitably occurs, is actively resisted.”²⁶ John Seely Brown strongly reinforces the ideas of community and intentional learning when he observes that it is

through participation in communities that deep learning occurs. People don’t learn to become physicists by memorizing formulas; rather it’s the implicit practices that matter most. Indeed, knowing only the explicit, mouthing the formulas, is exactly what gives an outsider away. Insiders know more. By coming to inhabit the relevant community, they get to know not just the “standard” answers, but the real questions, sensibilities, and aesthetics, and why they matter.²⁷

The task of the university is to make these communities—and especially the real questions, sensibilities, and values of those communities—open and accessible to those who want to learn. It is “the learning communities that universities establish and nurture,” as Brown says in language especially pointed for librarians, “that remove...[universities] from the realm of a delivery service, or from being *mere traffickers of information*.”²⁸

Brown was not describing space planning in writing of campus communities. Those of us responsible for libraries and other non-classroom learning spaces should be mindful of what he says, however, if we want buildings that foster intentional learning and that escape the pitfalls of schoolwork, if we want to promote learning communities rather than trafficking in information, if we want ourselves to enact the mission rather than merely to support it.

Conclusion: Enacting the Mission

Some features of a learning-centered design—with the generous provision of group study spaces and information and learning commons chief among them—are now regular features of library planning. It is far from clear that our concern with learning goes much beyond these features, however, or that a systematic understanding of learning deeply informs our design work. The library directors responsible for projects completed between 1992 and 2001 responded to a question about what they needed to understand in order to succeed with their projects by identifying library operations 85 percent of the time but modes of student learning only 41 percent of the time. Follow-up interviews indicated that what library directors had in mind in answering affirmatively about learning was little more than student preferences regarding group study space and types of seating.²⁹ I am aware of only two studies that were part of library space planning and aimed at a systematic understanding of the culture of student learning.³⁰

If we want to make learning happen in libraries, then understanding learning processes and applying that understanding systematically to our planning and design work



are the keys to further advance. To do this, we must think more like educators and less like service providers. We must build an understanding of how people learn, consider the pivotal role of intentional learning in that process, and—most critically—choose to enact the learning mission of our institutions rather than simply support it.

Most academic library mission statements say that the library's purpose is to *support* students and faculty, to *support* learning and scholarship, to *support*—that is—the institution's mission. For more than a century,

We must think more like educators and less like service providers.

the clearest way to provide that support has been to build the largest possible print collections of information resources, which inescapably came to dominate library space. But the viability of this book-centered paradigm began to fade in the 1990s, as vast quantities of information became available in virtual space and libraries became but one, and often not the preferred, source for information.³¹

Our obligation is now to create a new paradigm for the academic library.³² Fundamentally, the choice before us is that between viewing the library as an information

The choice before us is that between viewing the library as an information repository on the one hand and as a learning enterprise on the other.

repository on the one hand and as a learning enterprise on the other. We may continue to see the library as a source of information, treat readers as information consumers, and cast library staff as people who *support* learning by facilitating the use of information resources. Alternatively, we may choose to treat students as intentional learners rather than as consumers, view the library building as one of the chief places on campus where students take responsibility for and control over their own learning, and employ library staff to *enact* the learning mission of the university through being educators. Making this second choice is to make the choice for learning in library design. Making this choice is to launch a design practice centered on learning.³³

I have been a librarian for more than 30 years. I have worked at institutions where parts of library buildings were strongly influenced by the reader-centered design paradigm. Primarily, however, I have worked in buildings where books reigned supreme, and it must be said that I have done my part to fill these buildings to overflowing with printed information resources. But it has been my extraordinary good fortune to be a librarian at a time of technological change comparable in its revolutionary impact to the changes introduced in the Western world by Gutenberg and the Fourdrinier machine. Changes in information technology have only recently catalyzed the conditions in which a third design paradigm, focused on intentional learning, is possible. This possibility will best be realized when librarians cease to think of their mission as primarily one of supporting the academic work of others and, instead, come to see themselves primarily as educators, accepting the very considerable challenge—amounting to a paradigm



change in profession³⁴—of joining with students and faculty as collaborators in enacting the learning missions of our institutions.

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Notes

1. ©Scott Bennett, 2008. Readers of this paper and librarians may copy it without the copyright owner's permission if the author and publisher are acknowledged in the copy, and the copy is used for educational, not-for-profit purposes.
2. For more on nineteenth-century paper, see Bennett, "The Golden Stain of Time: Preserving Victorian Periodicals" in *Investigating Victorian Journalism*, ed. Laurel Brake, Alex Jones, and Lionel Madden (London: Macmillan, 1990), 166–83.
3. The *Penny Magazine*, first published in 1832, occupies a pivotal place in this revolution in price and abundance. See Bennett, "Revolutions in Thought: Serial Publication and the Mass Market for Reading" in *The Victorian Periodical Press: Samplings and Soundings*, ed. Joanne Shattock and Michael Wolff (Leicester: Leicester University Press, 1982), 225–57.
4. Dale Keiger, "Boxed Volumes," *Johns Hopkins Magazine* 60, 3 (June 2008): 36.
5. For information about Gilman Hall and the Eisenhower Library, see the library finding aid in The Ferdinand Hamburger Archives of The Johns Hopkins University, Record Series 03.010, <http://ead.library.jhu.edu/rg03-010.xml#id0x03518b60> (accessed January 12, 2009).
6. Altgeld Hall was designed to accommodate the president's office, meeting space for the board of trustees, and the library school as well as the library. Even Yale University, with one of the oldest and largest library collections in the United States, did not build a free-standing library building until 1860—a building (today's Dwight Hall) that was designed, tellingly, in the idiom of a Gothic church.
7. In fact, Sterling Memorial Library reflects both the first and second of these design paradigms. Sterling was built to accommodate large and fast growing collections, and the exterior view of this church-like building is not dominated by a spire (one of the most characteristic features of the New Haven cityscape) but by a massive book stack block. But almost all sense of the book stacks is lost upon entering the building. The inconspicuous placement of elevators and stairs keeps the reader focused on this entry floor and obscures the fact that one is in a building with 16 floors of book stacks meant to hold 3.5 million volumes.
8. Bennett, *Libraries Designed for Learning* (Washington, D.C.: Council on Library and Information Resources, 2003), 7–10.
9. *Ibid.*, 12.
10. *Ibid.*
11. Roger C. Schonfeld, *JSTOR: A History* (Princeton, NJ: Princeton University Press, 2003).
12. Bennett, *Libraries Designed for Learning*, 11.
13. This is surprisingly uncharted territory. The landmark report *How People Learn: Brain, Mind, Experience, and School*, ed. John D. Bransford, Ann L. Brown, and Rodney R. Cocking (Washington, D.C.: National Academy Press, 1999) is silent on space design and exemplifies the neglect of the physical environment in understanding learning behaviors. Nancy Van Note Chism observes that very little has been written that applies learning theory to the design of learning spaces; see her "A Tale of Two Classrooms" in *The Importance of Physical Space in Creating Supportive Learning Environments*, ed. Nancy Van Note Chism and Deborah J. Bickford, *New Directions for Teaching and Learning*, no. 29 (San Francisco, CA: Jossey-Bass, 2002), 8. Further illustrating this point is Betsy Barefoot et



- al., *Achieving and Sustaining Institutional Excellence for the First Year of College* (San Francisco, CA: Jossey-Bass, 2005). This book presents case studies of colleges and universities with excellent first-year programs. The criteria for selecting the case study institutions included nothing about the spaces within which those programs are conducted. Two noteworthy exceptions to this inattention to learning space are the excellent collection of essays, *Learning Spaces*, ed. Diana G. Oblinger (Boulder, CO: EDUCAUSE, 2006), <http://www.educause.edu/learningspaces> (accessed January 12, 2009); and Jeanne Narum, "Transforming the Physical Environment for Learning," *Change* 36, 5 (October 2004): 62–6.
14. For the University of Iowa Information Arcade, see Carol A. Hughes, "'Facework': A New Role for the Next Generation of Library-Based Information Technology Centers," *Library Hi Tech* 16, 3/4 (1998): 27–35. For the Leavey Library, see Deborah Holmes-Wong, Marianne Afifi, and Shahla Bahavar, "If You Build It, They Will Come: Spaces, Values, and Services in the Digital Era," *Library Administration & Management* 11, 2 (1997): 74–85.
 15. Good entry points to this literature are Donald R. Beagle, with Donald Russell Bailey and Barbara Tierney, *The Information Commons Handbook* (New York: Neal-Schuman, 2006) and Leslie Hass and Jan Robertson, *SPEC Kit 281 The Information Commons* (Washington, D.C.: Association of Research Libraries, 2004).
 16. Bennett, *Libraries Designed for Learning*, 3, 28.
 17. This "demotion" of books from their dominant position seems to many to be an attack on the culture of the book and antithetical to the very idea of a library. For more on how the Vogel Library defines itself as "The Learner's Library: A Library of the Future," see <http://www.wartburg.edu/library/mission2.html> (accessed January 12, 2009).
 18. Differences between the schoolwork mode and intentional learning are, of course, meant to resonate with the work of Robert Barr and John Tagg and the many others who have described the paradigm shift toward learner-centered pedagogy now underway in higher education. See Barr and Tagg, "From Teaching to Learning—A New Paradigm for Undergraduate Education," *Change* 27, 6 (November/December 1995): 12–25.
 19. Anthropologist Richard A. O'Connor describes this transformation in learning. "Most college students," he observes, "have twelve or more years of training in studying as a display activity. It's first done to please and, perhaps unconsciously, thus manipulate others. Bit by bit it then becomes how one pleases—and manipulates—oneself. A student can feel good about studying because it's the right thing to do. It's not thought to be fun or easy—studying is widely seen as self-denial—but the discipline can develop into an expressive form with its own small pleasures and distinctive rituals. In the end, studying becomes a practice with a life of its own. It's not just a response to assignments but a highly personal and often meaningful way of being a student" [emphasis added]. In "Seeing duPont [Library] within Sewanee and Student Life," a substantial appendix to the "Task Force Final Report for the Jessie Ball duPont Library," 2005, <http://library.sewanee.edu/libplan/plan1.html> (accessed January 12, 2009).
 20. Phil Race, *Making Learning Happen: A Guide for Post-Compulsory Education* (London: Sage, 2005), 26–33.
 21. Bransford, Brown, and Cocking, eds., 97.
 22. Carl Bereiter and Marlene Scardamalia, "Intentional Learning As A Goal of Instruction," in *Knowing, Learning, and Instruction: Essays in Honor of Robert Glaser*, ed. L. B. Resnick (Hillsdale, NJ: Erlbaum, 1989), 363, 377–8.
 23. *Ibid.*, 385.
 24. *Ibid.*, 385–88.
 25. It is perfectly possible, for instance, to create an information commons that fosters consumerism (such as "one-stop shopping" for assistance) and dependency on service providers rather than intentional learning. See Bennett, "The Information or the Learning Commons: Which Will We Have?" *Journal of Academic Librarianship* 34, 3 (May 2008): 183–5.
 26. Bereiter and Scardamalia, 388.



27. John Seely Brown, "Learning in the Digital Age," in *The Internet and the University: 2001 Forum*, ed. M. Devlin, R. Larson, and J. Meyerson (Boulder, CO: EDUCAUSE, 2000), 68–9, <http://www.educause.edu/ir/library/pdf/ffpiu015.pdf> (accessed January 12, 2009).
28. *Ibid.*, 69. Emphasis added.
29. Bennett, *Libraries Designed for Learning*, 20–2.
30. Both were conducted by anthropologists. One is by Richard A. O'Connor, "Seeing DuPont [Library] within Sewanee Student Life," and the other is *Studying Students: The Undergraduate Research Project at the University of Rochester*, ed. Nancy Fried Foster and Susan Gibbons (Chicago: Association of College and Research Libraries, 2007), http://www.ala.org/ala/mgrps/divs/acrl/publications/downloadables/Foster-Gibbons_cmpd.pdf (accessed January 12, 2009).
31. For one account of this profound change, see Jerry D. Campbell, "Changing a Cultural Icon: The Academic Library as a Virtual Destination," *EDUCAUSE Review* 41, 1 (January / February 2006): 16–31, <http://connect.educause.edu/Library/EDUCAUSE+Review/ChangingaCulturalIconTheA/40602> (accessed January 12, 2009).
32. Craig Hartman, an architect with Skidmore, Owings, & Merrill, observes that "while there is a long tradition to draw on, there is no agreed on paradigm for the library of the future. Getting to this paradigm is the task before us." See "Memory Palace, Place of Refuge, Coney Island of the Mind: The Evolving Roles of the Library in the Late 20th Century," *Research Strategies* 17, 2/3 (2nd–3rd Quarters 2000): 112.
33. See Bennett, "The Choice for Learning," *Journal of Academic Librarianship* 32, 1 (January 2006): 3–13.
34. For a discussion of how the collaboration described here implicates deep changes in academic culture and profession, see Jonathan T. Church, "Reimagining Professional Identities: A Reflection on Collaboration and Techno-Pedagogy," a report under the publications tab at the Web site "Talking Toward Techno-Pedagogy," 2000, <http://serendip.brynmawr.edu/talking/> (accessed January 13, 2009); Alison Cook-Sather, "Unrolling Roles in Techno-Pedagogy: Toward New Forms of Collaboration in Traditional College Settings," *Innovative Higher Education* 26, 2 (Winter, 2001): 121–39.