Academic Library Spaces:
Advancing Student Success and Helping Students Thrive

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Abstract: Are today’s academic libraries really designed for learning? Intending to spark broader and more informed dialogue about the relationship between the quality of learning and the quality of academic library spaces in higher education, the authors consider the concept of space as service; student learning and learning space; learning and its relationship to space; attributes of student learning spaces; and the assessment of learning spaces. The discussion of assessment includes formal and informal spaces, challenges to assessment, and recent projects designed to assess both spaces themselves and the impact of space on learning.

Introduction

Diana Oblinger writes about learning spaces:

Space—whether physical or virtual—can have an impact on learning. It can bring people together; it can encourage exploration, collaboration, and discussion. Space can carry the unspoken message of silence and disconnection. More and more we see the power of built pedagogy (the ability of space to define how one teaches). Spaces are themselves agents for change. Changed spaces will change practice.1

Discussions about academic libraries in the twenty-first century inevitably include consideration of physical space: library design trends; choice architecture, the careful design of how choices are presented; and how our campuses can best meet the needs of students and scholars by reimagining their spaces. Today’s academic research librarians understand and appreciate that spaces not only inspire creativity and innovation but also impact learning. The profession is committed to understanding, researching, and designing spaces that are conducive to learning, collaboration, and discovery. Spaces are changing as a result of new technologies and trends in experiential learning. Spaces are becoming more flexible, more adaptable, and more engaging. Spaces are becoming more like the classrooms they support. Spaces are becoming more like the spaces they inspire.

Spurred by this changing landscape, academic librarians are increasingly aware that their spaces are agents of change, or agents for change.2 These spaces are not only places for studying and learning but also spaces for the metacognition that goes on in the mind. They are spaces for the self-reflection that occurs in the mind. They are spaces for the self-reflection that occurs in the learning process. They are spaces for the self-reflection that occurs in the learning process.

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learning, students as knowledge creators, and more. The conceptualization and creation of libraries designed for learning reflect an increasing focus on student-centered design on our campuses.

Regional accrediting agencies and specialized accrediting agencies alike are concerned with learning resources and services, including physical facilities. Academic libraries are expected to provide and support student and faculty access and user privileges to adequate library collections and services and to other learning and information resources consistent with the degrees offered. Academic libraries are responsible for providing collections, resources, and services sufficient to support our institutions’ educational, research, and public service programs. Because accrediting agencies also focus on the operation and maintenance of our physical facilities, they ask us to assess whether our campus libraries appropriately serve the needs of our institution’s educational programs, support services, and other mission-related activities. Regional and specialized accreditation requirements and standards that pertain to learning resources and services invariably circle back to one thing—student learning.

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Learning and learning theory are now emerging as essential factors in library space planning. As a result, academic librarians’ definition of space as service is changing as well. Today’s academic libraries purport to deliver space as service. Libraries continually study user space needs, employing several methodologies to better understand student behavior. Data, information, and various studies of student behavior inform decisions about how to develop and deploy public services staff and how to develop space-based services as technology changes and user needs evolve. They also inform the development and refinement of renovation and construction strategies.

Space as Service

In 2006, Scott Bennett challenged librarians to embrace a paradigm shift in thinking about library space. He made a compelling case for thinking about student “information consumers” as student learners and “library service space” as learning space. Bennett’s ideas (in the paper cited here and others as well) have led many librarians to rethink the role of learning and learning theory in the planning and design of library spaces. Ten years later, Brian Mathews described libraries as “hives of activity” and “knowledge ecosystem(s).” These ideas coupled together paint a complex library landscape focused not on space programmed for library services and operations but on a variety of informal learning spaces designed to inspire students to learn.

The concept of space as service is hardly unique to libraries. The concept appears in popular and scholarly articles alike in a number of disciplines. Examples include space as service in experience-based business, designing open-plan workplaces for collaboration, community and social living, housing preservation and development, domestic service activities, statistical traffic modeling, addressable dispatchers in distributed computing,
game studies ("World of Warcraft: Service of Space?").\textsuperscript{10} and social resilience, such as the Israeli Project Renewal for the regeneration of neighborhoods.

The concept of space as service has become an intense and sustained focus in academic libraries. Our strategic plans increasingly include facilities and space as a core goal pivotal to setting current and future priorities, resource planning and allocation, program planning, review and refinement of academic missions, and strategic planning by constituent institutions and affiliated entities. As an example, consider the strategic plan for the 2016–2017 fiscal year of the University of Akron in Ohio. The plan includes five strategic directions: (1) academic engagement, (2) outreach and collaboration, (3) facilities and spaces, (4) access and discovery, and (5) professional development. One of the five strategic directions, facilities and spaces, is defined thusly:

Provide an inclusive, technology-infused environment with flexible places that are responsive to the needs of all users and that nurture engaged learning behaviors . . . For many users, their experience centers on interaction with the physical spaces of the Libraries. Our users understand and embrace the nature and value of library space, and they consider access to physical space one of the Libraries' core services. Access should, therefore, be transparent, be matched to their needs, and be barrier free. A “space as service” mentality allows us to impact directly the daily lives of our users.\textsuperscript{11}

At the University Libraries at Virginia Polytechnic Institute and State University in Blacksburg, the 2012–2018 strategic plan identifies four themes—areas in which the libraries will reinvent themselves. The first of these themes is learning spaces.\textsuperscript{12} In 2016, the libraries posted a vacancy announcement for a “fusion studio manager and learning space assessment coordinator.” Among the responsibilities listed for this new position are working collaboratively to design and implement a commons assessment program using ethnographic and user experience methodologies. The aim is to better understand and describe the interactions occurring within library spaces and to help optimize the environment for productive collaborations, creativity, and learning. There is also an opportunity for this effort to expand beyond the library buildings and to help evaluate informal learning interactions across numerous campus locations.\textsuperscript{13}

Articulating facilities and space as core goals in academic libraries’ strategic plans reflects our institutions’ deep commitment to respond to changing needs and challenges.

**Student Learning and Learning Space**

Student learning is core to our libraries’ and our institutions’ educational missions. Concern about the quality of student learning is front-and-center for educators, higher education administrators, regional accrediting agencies, and legislators at the state and federal level alike. Student learning is differentiated from student development, and discussions about student learning focus on knowledge, skills, attitudes, competencies, and habits of mind that students are expected to acquire at an institution of higher education. Students’ background knowledge—what students already know, old versus new knowledge, and student experience—are also subjects which have generated considerable attention. Discussions and debates focus on a wide variety of educational
programs, learning experiences, instructional approaches, and academic-support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students and groups of students. These ongoing conversations show that student learning remains a widely used concept that continues to defy precise and succinct definition.

Today’s physical learning spaces are formal and informal, social spaces and information spaces. These learning spaces accommodate a wide range of activities, technologies, and participants—both in-person and connected virtually. In these spaces, people need to be able to create, retrieve, combine, display, and share information, then do it all over again, all in a space that they can easily reconfigure and is well supported by staff that meet and anticipate their needs.

In a 2015 article for the Anytime Anywhere Learning Foundation, a nonprofit that works to provide children with the technology to learn at any time and in any place, John Abbott talks about designing contemporary one-to-one learning spaces for learners. Providing context for understanding today’s learning spaces, he writes:

> When we think about schools and classrooms, we probably think first about students and their teachers because schools are fundamentally about people. Next, we typically think about the activities students and teachers engage in while they inhabit those classrooms as well as the furniture and equipment, including technology, found within these walls. While these are typical and appropriate reactions, we must also consider another classroom perspective—one that is not often considered but that is just as vital for student success, and that is the vision of space and time in our 21st century 1:1 classrooms. This space and time can be encompassed in the term “learning spaces.”

While the foundation’s focus is on children, the authors suggest that Abbott’s definition of learning spaces will resonate within the environs of higher education as well. He writes that a learning space supports multiple and diverse teaching and learning opportunities and associated pedagogies, including current technologies. Because of technology and the learning resources it provides, students need no longer be constrained by time and space, but instead can participate in seamless learning wherein they learn anytime and anywhere.

### Learning and Its Relationship to Space

The study of people’s relationship to their environment is well-established. In 1936, the pioneering social psychologist Kurt Lewin articulated the theory of “life space”—that is, “the totality of facts which determine the behavior of an individual at a certain moment.” He suggested that moments in our lives are a product of physical, social, and psychological environments and that our experience of a moment is contextual. Physical space, “the room where [one] is and the position of the furniture and other objects that are important for [one] in the moment,” impacts an individual’s experience.

More recently, researchers involved in the study of personal space assert that this work “has implications for the study of instructional environments.” The design of a learning environment has the potential to hinder or promote the learning process.
Design elements must include not only practical considerations for functionality but also elements that resonate with the psychological and emotional aspects of learning:

In their theory of knowledge creation, Nonaka and Konno (1998) introduce the Japanese concept of “ba,” a “context that harbors meaning,” which is a shared space that is the foundation for knowledge creation . . . Knowledge embedded in ba is tacit and can only be made explicit through sharing of feelings, thoughts, and experiences of persons in the space. For this to happen, the ba space requires that individuals remove barriers between one another in a climate that emphasizes “care, love, trust and commitment.” Learning spaces similarly require norms of psychological spaces, serious purpose, and respect to promote learning.22

In many ways, the informal learning spaces in academic libraries have the potential to be the ideal learning environment. Many libraries, originally designed and built as large warehouses for books, find themselves with the opportunity—and the space—to reimagine, renovate, and provide a diverse variety of learning environments. In addition, learners in libraries have access to services and collections that facilitate learning. Lastly, the library environment can provide spaces for peer learning, an informal but critical way for students to learn from one another. Mathews asserts:

Our role is not to serve as just learning space managers, but to be community developers. We’re building a collection of niches and aim to integrate people with different beliefs, backgrounds, approaches, and opinions into a cohesive and welcoming setting. Libraries are well situated to accommodate these different communities . . . while placing them together in a shared experience.23

Attributes of Student Learning Spaces

Consideration of the attributes of student learning spaces may start with the idea that a learning space should meet a hierarchy of needs made up of layers of access and linkages, uses and activities, sociability, and comfort and image.24 Larry MacPhee’s report, published in 2015, considers informal spaces, formal spaces, and the attributes of learning spaces.25 He frames this latter section by writing:

When designing a learning space, little things like the position of controls, location of aisles in a room, or the way the light reflects off the board are very important. Picking the right furniture, choosing the right sound damping materials, or ensuring that there are enough electrical outlets can have a significant effect on the usefulness of a room. Most of these things are easy to get right in the design phase but hard or costly to fix later on.26

MacPhee’s list of attributes is perhaps the most comprehensive the authors have encountered.27

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The Current Climate for Assessment of Library Space

The evolution of library space over the past 20 years is well-known to practitioners. For many years now, colleges and universities have abandoned the notion of libraries as large warehouses that store massive physical collections. More recently, libraries responded to changes in pedagogy, technology, and student learning styles by creating spaces called information—and then learning—commons. As our ideas about space evolve, today’s academic research librarians have begun to see library real estate as home to complex learning ecosystems.

Mathews states that the value of libraries boils down to creating environments that stimulate productive collisions and knowledge spillovers. Learning is messy and we provide a high-touch location for these complex activities and diverse modes of expression. Nurturing the knowledge ecosystem is essential: outfitting our spaces to maximize intellectual and creative potential where people and ideas intermingle. We’re in the business of fostering happenstances as well as structured encounters. We bring people and information together so they can create and experience things that otherwise would not have been possible—or even imaginable.28

This trend logically follows the idea that student learning takes place in a variety of locations, with instructors and peers, and focuses on students as knowledge creators who learn by doing. With quiet places for reflection; technology-saturated areas for collaborative work; makerspaces equipped with 3-D printers, tools, and craft supplies; and more, the library is the ideal physical academic space to serve as the center of informal learning.

As a result, libraries now focus on creating informal learning spaces, “non-discipline specific spaces frequented by both staff and students for self-directed learning activities.”29 As academic library spaces have been changing, higher education has faced increasing pressure to produce evidence of its value. The rising cost of earning a degree, competition from for-profit education companies, and decreased state and federal funding have resulted in close scrutiny and calls for accountability. Students, tuition-paying parents, accrediting agencies, and law- and policy-makers want to know the return on investment for an advanced degree. As a result, college and university administrators have increased their focus on assessment and student learning outcomes.

Likewise, academic research libraries now grapple with how to demonstrate their direct impact on student learning and student success. Academic libraries “are now challenged to become agencies of learning meant to enact institutional mission.”30

The Evolution of Assessment

Libraries have long used numbers for assessment, relying on “the ‘more is better’ benchmark.”31 Librarians count volumes in collections, service desk transactions, the
circulation of items, visits to Web pages, and much more. User satisfaction surveys (such as LibQUAL+®) were created to help librarians assess and improve the quality of services. It is not clear that any of these methods provide data to support the assertion that libraries, and library spaces in particular, impact student learning outcomes. Thought leaders now suggest that evaluating libraries’ learning spaces requires “moving beyond preferences and figuring out, ‘Do they like it?’” A more robust suite of qualitative and quantitative measures must be developed to capture the impact of academic library spaces on student success.

**Assessment: Challenges and Barriers**

Prior to discussing the difficulties related to the assessment of informal learning spaces, it is useful to touch briefly on recent research focused on the assessment of traditional classroom settings. Much of the literature that examines student learning and formal classroom spaces centers on changes to physical learning environments that have accompanied alterations in pedagogy, student demographics, and learning technologies. Increasingly, students and faculty meet in flexible, technology-rich classrooms that support collaborative learning, problem-solving activities, and knowledge creation. Researchers studying the impact of these nontraditional classrooms on learning outcomes have been frustrated by the inability to isolate space from the multitude of other factors that influence learning. The other factors include student learning styles; the time of day the course is taught; the instructor’s engagement, teaching style, and effective use of the space; the number of students enrolled in the course; environmental conditions in the space; and more. The development of measures “to determine the impact of learning spaces [is] fraught with complexity.” These complications apply to formal learning spaces. The problems multiply when one seeks to evaluate informal learning spaces in a library setting.

To begin, colleges and universities each have their own specific constituency, mission, and history. As a result, academic libraries design and provide a variety of customized learning spaces designed to support their individual institutions. Further, informal learning spaces in libraries have “overlapping functions” that make it difficult to evaluate a learning space designed for multiple purposes. A space designed to support collaborative work is also used by individuals. The learning experience that comes from an hour in a makerspace may or may not be bound to the tools available. Students in a café may engage with a professor, or they might just have coffee. Increasingly, academic library spaces are “complex adaptive systems” filled with individual learners whose needs differ based on a multitude of circumstances.
It may be that the relationships of space to learning, especially if seeking a causal correlation, pose a set of questions that are difficult, if not impossible, to answer. Learning is ultimately a highly individualized change in personal knowledge. It cannot be understood out of context of the individual learner’s experience, prior knowledge, motivations, and processing of data.39

One issue that contributes to this problem of assessment lies in the failure of libraries to incorporate goals for student learning into the space-planning process. Often, “priorities have much more to do with the problems of owning buildings and running libraries than with the problems of learning.”40 Librarians and other educators, working with architects, builders, and designers, need to bring to the planning process an understanding of learning theory and to establish learner-centered goals for new spaces. Bennett writes:

The concept of learning we actually use is rarely more sophisticated than that sometimes students prefer to work alone, sometimes they would rather work collaboratively, and sometimes they like to make things. This is a patently simplistic concept of learning; it almost entirely fails to engage with the stance of an intentional learner.41

Facing tight budgets, focusing on the practical necessities of new space, and sometimes bound by the expectations of university administrators, library planning teams can often allow learning theory to fall to the wayside.

**Early Days: Strategies for Looking Ahead**

Given the myriad problems associated with learning space assessment, how do we proceed? In 2011, the EDUCAUSE Learning Initiative, a nonprofit organization that works to advance higher education through information technology; college and university representatives; learning space consultants; and vendors partnered to begin development of a Learning Space Performance Rating System. The system is based on the rating systems used to certify environmentally friendly “green” buildings. This project focuses on the evaluation of the potential of the space to facilitate learning, not on the learning that takes place there. The group’s first priority is to develop a rating system for formal classroom spaces with the intent of incorporating informal learning spaces into the system over time. This work group, acknowledging the complexities of learning space assessment, has adopted an unusual approach:

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We posit that measuring each space’s impact on learning through a post-occupancy evaluation and longitudinal research is far too costly and time-consuming an approach to be viable for a rating system. It is also quite difficult to assert a definitive causal link between attributes within a space and improved learning outcomes. Thus, rather than measure actual performance, we plan for the system—at least initially—to measure...
potential performance, that is, to assess what the space enables students and faculty to do in it. So, the Learning Space Rating System will contain a series of design criteria that have been correlated with more effective learning and/or established best practices and we will evaluate how well those criteria have been met rather than how well the room is being used.\textsuperscript{42}

Writing about the project, Elliot Felix and Malcolm Brown note the urgent need for an instrument that will help libraries assess and improve classroom spaces based on set standards and third-party certification.\textsuperscript{43}

There are also projects seeking to focus on learning in library spaces. LibValue\textsuperscript{®} was a “three-year study funded by the Institute of Museum and Library Services to define and measure ways in which academic libraries create value through research, teaching and learning, and social, professional, and public engagement.”\textsuperscript{44} The University Libraries at the University of Tennessee, Knoxville used LibValue\textsuperscript{®} theories and tools to examine the value of the libraries’ Commons in relation to retention and graduation rates. The researchers stated, “Understanding the value of this space in support of the teaching and learning mission of the university compared with other campus spaces (classrooms, student unions, etc.) will help the library define its unique value to the university.”\textsuperscript{45} Students completed surveys about their use of the Commons’ services and resources. Survey data were combined with data about student admissions, demographics, and progress toward a degree to evaluate the relationship between use of the Commons and grade point average and rates of retention and graduation. In addition to data that support the idea that the Commons can be linked to student success, retention, and acculturation to the university, the librarians reported an unexpected outcome: the University Libraries are now considered “a model for campus informal learning spaces.”\textsuperscript{46}

In 2013, the Learning Spaces Collaboratory (LSC), a group of academic leaders, architects, and others interested in improving spaces for learning, published a guide intended to shape and inform the design and assessment of all kinds of learning spaces in higher education.\textsuperscript{47} The work is a blend of conceptual and practical discussions of the process and includes case studies. Because the guide targets all kinds of campus spaces, it proves useful to librarians seeking to consider campus learning spaces outside of the library context. In addition, the LSC website includes an “emerging” assessment template with a draft assessment rubric.\textsuperscript{48}

Nonprofits, such as the Society for College and University Planning (SCUP), are making important contributions to the conversation as well. Published in 2013, SCUP’s “Research on Learning Space Design: Present State, Future Directions” deals with all kinds of campus learning spaces and how design impacts student outcomes. Interestingly, this research focuses not only on formal and informal learning spaces but also on higher education campuses as a whole.\textsuperscript{49}

These examples provide different approaches to understanding the use and impact of learning spaces. They also give us a better understanding of learning spaces, case studies, guidelines, and tools to use. Danuta Nitecki suggests these are early days for learning space assessment and that new methods are vital:

The profession adapted research and theory developed in other fields, such as marketing and business, for the assessment of libraries as service organizations. It now is expanding
its adaptability to work with research in such diverse fields as learning sciences, architecture and interior design, environmental studies, pedagogy, instructional design, and anthropology. Exploring the relationship of space, and its design and use, to the functions of the academic library is a rich topic but one only beginning to be addressed in the library literature and culture.50

Are Librarians Learning about Learning?

The scholarly literature in many fields of study articulates this relationship of space to learning, and librarianship is engaged in its own lively discussion. We have discovered research, tools and toolkits, strategic plans, job postings, reports, and thought pieces that emphasize the need for academic libraries (and often higher education as a whole) to embrace student learning as the central focus of changes to our library spaces. Some evidence suggests that libraries are adopting this approach. Discussing the interior renovation of the Charles E. Odegaard Undergraduate Library & Learning Commons at the University of Washington in Seattle, Ruth Baleiko, a member of the Miller Hull Partnership, the architects who designed the renovation, emphasized

a stronger relationship between student learning outcomes and the library. Our team seized this and worked with the university to identify a series of behaviors or learning experiences that global citizens should have as part of their university education. This list acted as the driver for design interventions within the building: All the elements we added were directly related to accomplishing and expressing those learning outcomes.51

We acknowledge that there is no immediate or one-size-fits-all answer to these issues of space design, planning, and assessment. We also recognize that many academic research librarians, from frontline practitioners to senior administrators, must grapple with the interrelated issues of library space design and student learning in the context of budget constraints and the expectations of various constituencies. In higher education, there is a growing understanding that the layout of our campuses, the design of our academic buildings, and the quality of the education we provide all have an impact on academic culture and student experience. Today’s marketing, student recruitment and retention strategies, and practices in higher education increasingly reflect an emphasis on the whole experience of learning. Understanding the potential of space to positively impact student learning and student success, intentional library space planning must be a priority.
If we accept the idea that academic libraries are ecosystems, we are challenged with developing increasingly complex spaces. We do so against the backdrop of changes in student demographics, an uncertain fiscal climate, and the ever-shifting and evolving landscape of technological possibilities. We must build learning goals into the design and planning process so that we know what to assess after our repurposed or new spaces are occupied. We would not think of planning a major building or renovations project without architects; similarly, we should not think of excluding experts in student learning from our team. As academic library services, and the idea of space as service, evolve, academic research librarians must make it a priority to create spaces that maximize student learning outcomes.

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Notes

8. Ibid., 151.
9. The authors recognize the centrality of virtual learning spaces to the learning process; however, our focus here is on physical learning spaces.
13. Ibid.
16. North Carolina State University, brightspot strategy, AECOM, and Institute of Museum and Library Services, “Learning Space Toolkit,” http://learningspacetoolkit.org/about/. The Toolkit is a product of North Carolina State University (NCSU) Libraries and its Distance Education and Learning Technology Applications (DELA) partnership with strategic consultants brightspot strategy and AECOM to design, share, and promote an updated model for institutions to plan and support technology-rich, informal learning spaces.
17. Anytime Anywhere Learning Foundation (AALF), “The Anytime Anywhere Learning Foundation: Transforming Learning through Universal Access to Technology,” http://www.aalf.org/. According to the AALF website, “The goal of the Anytime Anywhere Learning Foundation (AALF) is to ensure that all children have access to unlimited opportunities to learn anytime and anywhere and that they have the tools that make this possible.”
20. Ibid., 18.
26. Ibid.
27. MacPhee addresses furniture; lighting; acoustics; line of sight; electrical, heating and cooling; server rooms; room access; classroom movement patterns; food and drink policies; capturing audio and video; retrofits; storage needs; monitors; televisions; document or PAD cameras, which can be used like overhead projectors to display small or fragile objects; LCD (liquid crystal display) projectors; projection screens; electronic (smart) whiteboards; screen control and sharing; software deployment; access privileges; Internet access; network storage; seating; desktop PCs (personal computers); laptop programs; PDAs (personal digital assistants); netbooks and UMPCs (ultra-mobile PCs); thin clients, computing devices that rely on a server to perform data processing; and platform switching.
33. Oblinger, “Space as a Change Agent.”
34. Following a research project conducted in the United Kingdom, D. Christopher Brooks asserted, “To our knowledge, this is the first piece of empirical evidence that demonstrates that space, and space alone, affects student learning.” He acknowledged, nevertheless, that “The strong evidence of the positive impact of space on student learning however, only scratches the surface of the research that needs to be carried out in the field of learning spaces.” D. Christopher Brooks, “Space Matters: The Impact of Formal Learning Environments on Student Learning,” British Journal of Educational Technology 42, 5 (2010): 719–26, doi:10.1111.j.1467-8535.2010.01098.x.
36. It is important to recognize post occupancy evaluation (POE) as a field that does assess physical learning environments in higher education. As recently as 2014, one study stated, “This literature review clearly indicates that approaches to evaluations that attempt to assess the effectiveness of physical learning environments in supporting pedagogical activities are in their infancy and require further development.” Benjamin Cleveland and Kenn Fisher, “The Evaluation of Physical Learning Environments: A Critical Review of the Literature,” Learning Environments Research 17, 1 (2014): 1–28, doi:10.1007/s10984-013-9149-3.
38. Mathews and Soistmann, Encoding Space, 124.
40. Bennett, “Putting Learning into Library Planning,” 220.
41. Ibid., 221.
43. To learn more about this interesting project, see http://www.educause.edu/eli/initiatives/learning-space-rising-system.
46. Ibid.