Re-Imagining Learning Spaces: Design, Technology, and Assessment

A Report on the ELI Fall Focus Session

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ELI Paper 3: 2014
November 2014

Abstract
Members of the higher education teaching and learning community gathered online for the EDUCAUSE Learning Initiative Fall Focus Session on October 28 and 29, 2014, to talk about the interplay of space and learning and how to design learning spaces for maximum benefit. Presenters and participants were clear from the outset that space, technology, and pedagogy are the key elements and that developing and supporting effective learning spaces requires understanding how these factors work together to enable active learning.
There are good reasons why we don’t sleep in the kitchen, eat cereal with a fork, or cut the grass with scissors. We have other tools and rooms that allow us to accomplish those tasks with much greater efficiency and better outcomes.

For hundreds of years, classroom learning took place in rooms based on a single model—a collection of desks or tables all facing an instructor’s podium or desk—and many classrooms today continue to be arranged in this lecture-style format. For a certain kind of pedagogy, this design makes sense. If the concept of learning is the transmission of knowledge from a single source to a classroom of students who receive that learning passively, then this arrangement is an appropriate model.

For at least a couple of decades, though, new ideas brought to the learning enterprise have encouraged instructors and students to rethink how learning spaces are designed, the tools that are available in those spaces, and the kinds of learning activities that take place there. These new ideas are often the products of developments in information technology and of a growing body of knowledge about how learning actually happens. A central part of that knowledge is the understanding that active learning—learning that engages students and compels them to take responsibility for their learning—can lead to considerably better outcomes. But conducting active learning in a conventionally arranged classroom can feel a lot like eating cereal with a fork. It can be done, but there are better ways.

**Technology, Pedagogy, and Learning Spaces**

Members of the higher education teaching and learning community gathered online for the EDUCAUSE Learning Initiative Fall Focus Session on October 28 and 29, 2014, to talk about the interplay of space and learning and how to design learning spaces for maximum benefit. Presenters and participants at the focus session were clear from the outset that space, technology, and pedagogy are the three legs of the stool and that developing and supporting effective learning spaces requires understanding how these factors work together to enable active learning.

Unraveling the interconnectedness of these three components and treating them as a system will allow colleges and universities to create learning spaces that can keep pace with—and, in some cases, inform—developments in the tools and techniques for learning and assessment. One presenter noted that workplace activities are increasingly multidisciplinary, and because employers want to hire graduates who are ready to work, students need to learn in environments that are themselves multidisciplinary and promote a kind of learning that depends on discovery, doing, and making. At the intersection of pedagogy, space, and technology is the opportunity to teach students how to be discoverers.

Many factors are involved in effective learning spaces. Making the most of these opportunities calls for thoughtful planning, attention to both broad and specific variables, and an openness to the changing dynamics of teaching and learning facilitated by new designs and new ideas. Not to be overlooked is the assessment and evaluation of learning spaces to provide the data and insights needed for continuous improvement and innovation.

**Effective Planning**

Learning spaces rarely see the light of day without some planning. What’s at issue today is the scope of planning that goes into effective learning spaces. Several presenters at different kinds of institutions described learning-technology environments that had developed on their campuses over the years without much coordination between the groups involved. Groups including faculty, students, facilities, IT, the registrar’s office, and others all have a stake in the institution’s learning spaces, though they don’t all have common needs or goals. Because classroom resources involve so many facets, various units across campus often find themselves working at cross-purposes.
The solution in several contexts was to restructure the organizations responsible for learning spaces, sometimes creating a new committee with oversight of all the institution’s development and design of learning spaces. For such groups to succeed, they need broad participation from many campus units; they need an effective governance structure; and they usually also need authority over the funds for learning spaces. In addition, such groups benefit from the explicit support of the provost or other senior campus leader.

Having a master plan can be a critical element of success for a unit charged with overseeing learning spaces. That plan would include clear guidelines for reviewing and prioritizing the construction or redesign of learning spaces, and those guidelines would factor in the needs of all parties involved. To the extent that the institution has developed master plans in other areas, such as an IT or an institution-wide strategic plan, the learning spaces plan should be aligned with the goals and directions of those plans. Only then can efforts be unified across the campus.

Among the resources institutions can turn to when planning learning spaces are FLEXspace and the EDUCAUSE Learning Initiative’s Learning Space Rating System (LSRS). FLEXspace is an open database that serves as a repository of information about learning spaces. The system includes descriptions, photos, and other details of learning spaces at colleges and universities from around the world. The tool allows institutions to browse a growing library of design ideas, enabling the review of a large set of options without the costs and time of traveling to visit different campuses. The LSRS is a system of rubrics to evaluate learning space designs against a wide range of criteria, assigning a score along each dimension for how well the space facilitates active learning. The scores can be used to compare learning spaces, identify areas for improvement, and seed innovation.

Finally, at the tactical level, presenters from one institution noted that their committee responsible for learning spaces holds its meetings in various classrooms around campus. In this way, members of the team see firsthand some of the shortcomings of the spaces slated for redesign. This awareness has had a positive impact on the group’s work at prioritizing the project proposals it is reviewing.

**Design Ethos**

One presenter noted that the learning spaces that many institutions are deploying today have many elements in common and do not differ by discipline. Some of the specifics do matter—a chemistry lab needs equipment and systems not needed for a history classroom—but the notion that the general principles involved in a classroom designed for active learning apply to any subject area resonated with many focus session participants.

In a similar vein, several institutions are creating spaces based on the characteristics of active learning, while leaving those classrooms flexible enough that the users have considerable latitude in deciding exactly how the spaces are used. Rather than a prescriptive approach, these institutions have intentionally designed the kind of flexibility that facilitates and encourages serendipity in the use of those spaces. For instance, rather than a room specifically set up for team-based learning (with circular tables fixed to the floor), a space might have tables on wheels that can easily be reconfigured to suit a wide range of learning activities.

Another approach, which at first might seem to go in a different direction but that might better be described as complementary, is to invest time in researching and exposing the needs of various user groups—including staff—and design spaces to accommodate those needs. In this context, the focus was on the services provided by a learning space and mapping those services to different groups of users. The result can ensure that the users of a learning space have access to the services they need, while also generating greater engagement among the institutional staff who provide those services.
Classroom Considerations

When approaching either the retrofit of an existing classroom or the design and construction of an entirely new building to house learning spaces, institutions face a long list of specific concerns that will influence the effectiveness of those spaces. New construction represents a clean slate, allowing for novel designs only limited by the imagination and money. Reworking a single room in a 150-year-old building involves numerous challenges, including wiring, ventilation, preservation of existing façades, and so forth. In either case and everywhere in between, institutions should stay focused on the principles of active learning and make sure to sweat the details.

Sometimes raising the floor by just an inch or two allows wiring options that will make an enormous difference to students at seating pods. Acoustics is another area of concern that is often overlooked, though it can have significant impacts on the usability of a space. One institution installed a system of discreet microphones and sound controllers to manage the acoustic performance of a large learning space, allowing the instructor to create different conditions for different learning activities.

Another concern is the amount of space needed for an active learning classroom to be effective. Lecture-style rooms have the advantage of putting a lot of students in a given area. Active learning classrooms, by contrast, require more physical space—some estimates suggest that active learning might require nearly double the square footage per student that a lecture room needs. This difference can have considerable repercussions for how many active learning spaces a campus can support.

Not all technology is information technology, and often the selection and placement of tables, whiteboards, and other furniture can be more important to the design of a space than the computers, projectors, and other digital components. Institutions should be aware of the ratio of spending on furniture to that of information technology, keeping in mind that furniture last a lot longer than electronics. In choosing furniture, often the small details, such as whether the legs of a table allow free movement of chairs and people's feet, can make a huge difference in the functionality and appeal of a learning space.

In the case of one institution, a new library used so much intuitive design and provided such flexible spaces that the building has almost no signs. Enough attention was paid to the details that students, faculty, and other visitors to the library simply “get” how the various spaces can be used.

Social Dynamics of Active Learning

The design of a learning space sends a message about the kinds of activities that will take place there. The design sets expectations and establishes the roles of instructor and student. In a traditional classroom, this means lecture-style learning from the “sage on the stage.” In contrast, an active learning setting decentralizes the teaching and learning, creating a new dynamic that emphasizes student responsibility and participation in learning. In this way, active learning spaces change the relationships in a classroom—between students, between students and instructors, and between students and content.

A recurring theme of the focus session reinforced this notion of giving students control over their learning. In some of the research into learning spaces, one of the factors associated with better student outcomes was shown to be related to control. Specifically, it had to do with the degree to which students feel as though they have the ability to choose how they learn and how much they learn, as well as feeling “safe to volunteer” answers. Another presenter described it as “getting out of the way of students” and giving them discretion over how and where they learn. In another example of a flexible learning space, students show up to class and arrange the furniture themselves, setting up the space in a way that best suits the activities of that course.
Re-Imagining Learning Spaces

These and other examples highlight the ways in which an active learning space creates a different social dynamic from the kind typically found in a conventional classroom. The design of these spaces can say to students that the institution and the instructor have faith in the students to be active participants in the learning that will take place. Faculty development is, of course, another component of changing the approach to teaching and learning. With the new opportunities and expectations from reimagined learning spaces comes the need to develop new kinds of faculty development to help instructors make the most of the resources and the dynamics of active learning.

Research and Assessment

The other side of planning is assessment, and a growing amount of research focuses on evaluating the effectiveness of new learning spaces. Several such projects were discussed at the focus session, covering pilot programs and established spaces. In developing active learning spaces, it’s important to remember that a particular classroom design does not always lead to the same kinds of results. Outcomes can vary considerably along many variables, and continued progress in this area will rely on efforts to measure outcomes and share the results.

The National Survey of Student Engagement (NSSE) is one resource that can contribute to the conversation about assessment. NSSE helps provide objective evidence of the impact of innovations in learning spaces, and some institutions are using those criteria in discussions about designing or renovating classrooms on campus. NSSE is a trusted resource that often provides a connection for senior institutional leaders.

Research into cognitive and brain science can also be an important part of understanding and evaluating learning spaces. Several presenters pointed out the value of observational research as a complement to other methodologies, such as conducting student or faculty surveys and comparing data such as grades and completion rates.

An Ongoing Journey

A traditional lecture hall with stadium-style seating all facing a stage or dais—as well as the style of teaching and learning for which lecture halls were designed—might always have a role in higher education. What is clear from years of innovation, however, is that other kinds of learning spaces offer the ability to cultivate very different forms of teaching and learning and that in many instances, nonlecture activities result in more and better student learning than conventional pedagogies. Also evident is that there is a complex, evolving, and interesting dynamic between the space where learning happens, the pedagogy behind that learning, and the technology and tools used for learning.

Building or renovating learning spaces is expensive, with colleges and universities spending millions of dollars on such projects. Whether an institution is breaking ground on a new academic building or a library or retrofitting an existing classroom, the stakes are too high not to plan thoroughly, consider many options, and conduct solid evaluations. Learning spaces can include classrooms, study rooms, maker labs, media rooms, and many other kinds of places where learning can happen. Understanding all the moving parts is complicated, but the principles of active learning apply similarly across virtually any learning space. And the effort spent on designing and assessing formal learning spaces might also help us understand informal spaces and other settings.
Sessions and Speakers

Resources from the focus session, including slides and other session materials, as well as recordings of the presentations, can be accessed online.

- **Crista Copp** and **Matthew Frank**, “Drafting a University Master Plan for Learning Spaces”
- **Paul Baelper** and **J. D. Walker**, “Active Learning Classrooms and Social Context: Changing Relationships to Improve Learning”
- **James P. Frazee, Megan Marler, and Lisa A. Stephens**, “FLEXspace: Flexible Learning Environments Exchange”
- **Tanya Joosten**, “Exploring the Impact of Active Learning Spaces on Teaching and Learning”
- **Jeremy Todd**, “UMN Technology-Enabled Classroom Design”
- **Mark S. Valenti**, “Beyond Active Learning”
- **Adam B. A. Finkelstein**, “Building a Community to Redesign Learning Spaces across Campus and Make Them a Strategic Priority”
- **Robert Emery Smith**, “The Design and Assessment of Next-Gen Flex Classrooms”
- **Frank Kolavo** and **Chris Kolavo**, “Evolving Teaching Methods Drive Changes in Learning Space Design and Furniture”
- **Shirley Dugdale**, “The Learning Space Rating System (LSRS)”
- **Elliot Felix**, “Outside In, Inside Out: Designing and Delivering Services within Learning Spaces”