AMY DONOHUE, AIA, LFA, NOMA | JULY 6, 2023

Engaged Learning at All Scales: The Oregon State University Learning Innovation Center

When the Learning Innovation Center (LINC) at Oregon State University was built in 2015, it upended traditional university lecture halls with its unique "in the round" design. We have since seen the phenomenon of these signature arena classrooms surface around the country.

This whitepaper will explore how a project that began as a "typical" general-purpose classroom building evolved into such a successful prototype advancing student engagement and learning.

ABOVE The 600-seat "in the round" arena design of the OSU Learning Innovation Center has served as a prototype for classroom design nationwide (Photo by Steve Maylone)

ABOUT THE AUTHOR

Amy Donohue, AIA, LFA, NOMA, is a Principal at Bora Architecture & Interiors with over 25 years of experience that includes award-winning designs for 21st-century academic environments. As the design principal for LINC, Amy brought her deep understanding of interdisciplinary and synergistic environments from a range of sectors to the process, resulting in a game-changing facility lauded for its unique and innovative learning spaces.

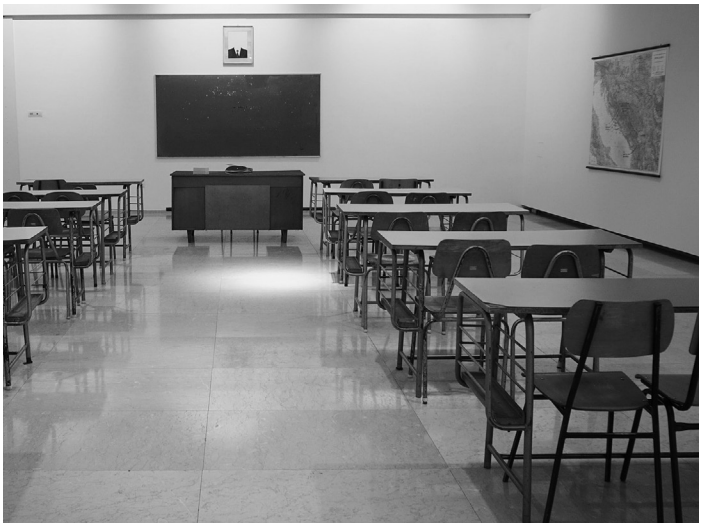
THE NEEDS OF A GROWING CAMPUS

In the summer of 2011, Oregon State University set forth to build a new general-purpose classroom building for their main campus in Corvallis. After experiencing a sharp increase in enrollment, the University needed to expand its classroom seat count by 25%. Space utilization was nearing 95%, leaving OSU little flexibility to add new courses. Classes were being scheduled late into the evenings to accommodate their needs—not a recipe for success in terms of student engagement. These realities directly contradicted the institution's role as a higher education leader in the Northwest, one of only two universities in the nation with land-, sea-, space-, and sun-grant designations.

The case for this new building was twofold:

• **The need for more space.** The economics of educating a growing student population required larger lecture-style classrooms. The preliminary list of program spaces OSU specified included learning environments with headcounts of 600, 400, 300, 200, and 120, and a host of spaces at the 72-seat size. A total of 2,400 seats were planned for the building. These numbers were generated by the registrar, a result of a quantitative analysis of needs for classroom space on campus.

• **The need for better space.** In addition to the capacity issue, there was a qualitative case to be made for this new classroom building. OSU's graduation and retention rates, at 64% and 82% respectively, were low compared to those of competitors and other land-grant institutions around the country. With the need to accommodate the sizable general education courses common to freshmen and sophomores in a large public school, the University wrestled with how to best engage students in their learning—especially given the traditional learning environments on campus. "Sage on stage" rooms often hosted large survey classes in the sciences and humanities, with students often seated 60 to 80 feet away from their instructor, and the more active learning classrooms students knew in their K-12 years were notably absent.



ABOVE Many campus classrooms have been designed to deliver information rather than exchange ideas

ABOVE Oregon State University campus (Photo courtesy of OSU)

Understanding these quantitative and qualitative goals for the project, Bora kicked off the design process with an initial meeting with academic leaders on campus, including Becky Warner, OSU Associate Vice Provost for Academic Affairs, and Lois Brooks, OSU Chief Information Officer. These campus leaders shared their desire to satisfy the registrar's needs, while simultaneously creating spaces where students and faculty could engage with one another, in turn maximizing learning and increasing graduation and retention rates.

As designers, our charge for the project was clear: create active learning at all scales to boost OSU's rates of graduation and retention.

NEW ENVIRONMENTS FOR ENGAGED LEARNING

University life is fundamentally about human interaction—faculty and students coming together to share knowledge, stories, and ideas. It is this exchange between people that drives advancement across all academic disciplines, from science and engineering to humanities and the arts.

Form often follows function, but for standard university classrooms, that has not been the case. For hundreds of years, classrooms have been modeled to deliver information, not exchange it. Most professionals working today were educated in spaces where they sat facing forward, looking at the backs of their colleagues, distant from their professor. In these learning environments, we lost the sense of sharing that is at the foundation of learning.

Luckily for the current generation of students, this attitude toward classroom design is changing. We are seeing the classroom shift to a more enveloping format—seats wrapping around the professor, students seeing one another across the room, walls covered in writing surfaces, and a generosity of space for group work. The idea of learning as an active exchange is starting to show itself in classroom design, a critical component in achieving a more connected curriculum across disciplines.

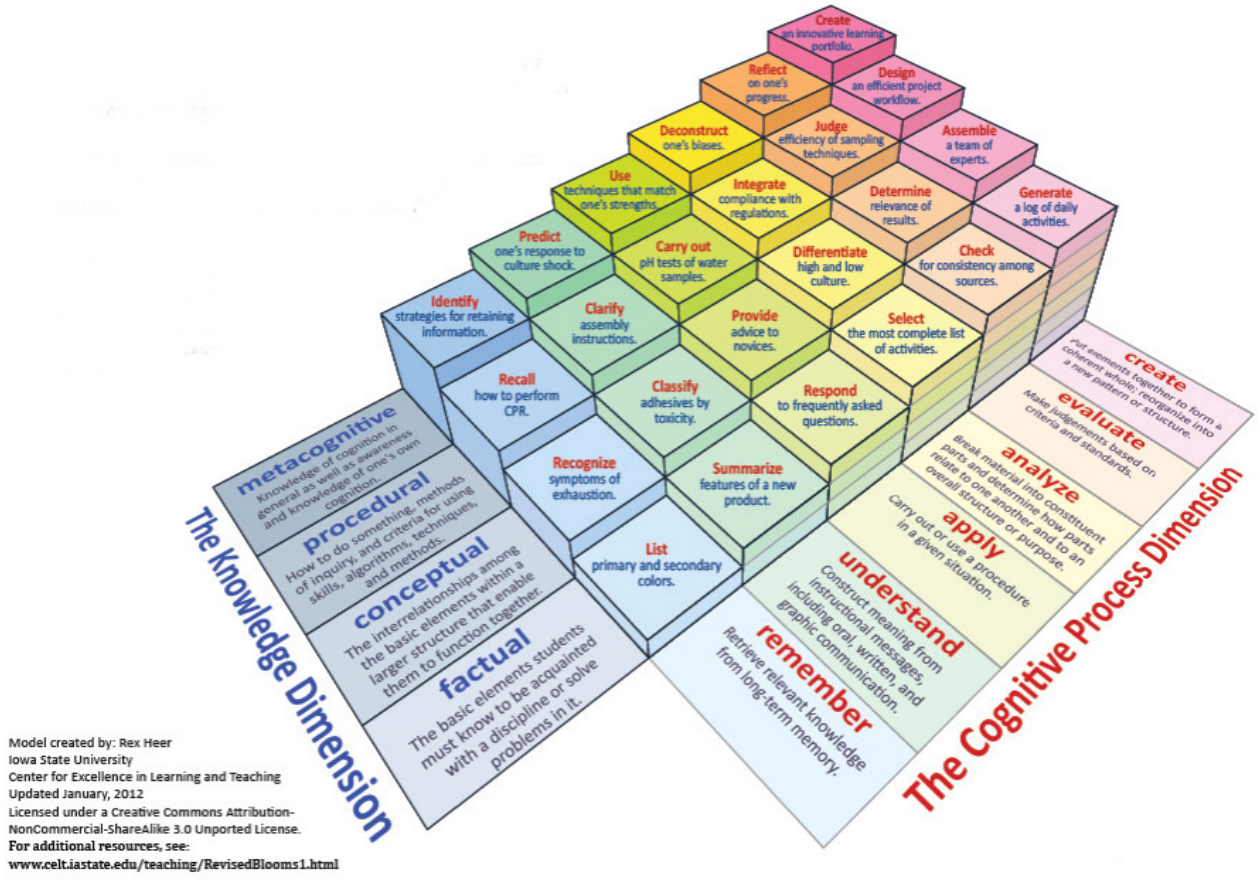
ABOVE Scale-up classroom within LINC (Photo by Steve Maylone)

In today's higher education landscape, most active learning happens within room sizes of less than 72 seats. For more than a decade, "scale-up" classrooms have been employed to boost learning outcomes and engage students in the sciences. Developed at North Carolina State University, these are typically 72-seat rooms organized in eight tables of nine students—a size easily broken down into three teams of three for group work. Smaller rooms, ranging in size from 20-50 students, can easily be made more active with flexible furniture and teaching walls surrounding the space.

Conversely, there are few precedents in the higher education landscape showing engaged learning in spaces for greater than 100 students. This was the key issue for our approach to learning design at Oregon State University. Considering how best to nurture engagement for larger class sizes required us to step back and think broadly about human contact. *How can we best engage students in spaces that need to accommodate such a large population? What does active learning look like at this scale?*

Digging deeply into activities in the brain when learning, we studied Bloom's Taxonomy of Learning, considering the most passive kind of learning (memorization) alongside the most active kind of learning (making). *What kind of space would support the "hot pink" activities of learning?* As we started the process, we researched beyond academic precedent, seeking examples from television studios, government houses of parliament, and runways—to name a few.

We wanted to understand the most successful relationship between audience and performer, student and teacher—and then wrap the design around those objectives.



ABOVE Bloom's Taxonomy of Learning diagram

For the Bora design team, pedagogy drove configuration, rather than the room dictating or limiting what kinds of teaching could happen in a particular space.

Translating this information to architecture and principles of design was our next charge. To engage faculty in the conversation on the capacity and configuration of classrooms, we hosted a series of pedagogy charrettes. With the faculty, academic leadership, and the classroom technology team, we developed the spatial characteristics necessary to achieve engagement, principles that would guide design regardless of room size. These included considerations in:

• **Visibility:** All students should have optimal sightlines to faculty and media. Students should also be able to see one another, an important factor to learning often discounted in this category.

• **Proximity:** Research in proxemics shows that if a human comes within fifteen feet of another person, that person is hard-pressed to ignore them. And because 65 feet is the maximum distance from which one can see facial expressions, the furthest row from the instructor in a learning environment should not exceed this distance. This posed the question of how we could encourage faculty to move out into the room and connect to every student within that critical 15- to 65-foot "radius of engagement."

• **Mobility:** Faculty can easily move about the room such that there is no "back row," with technology that enables seamless flow throughout all students.

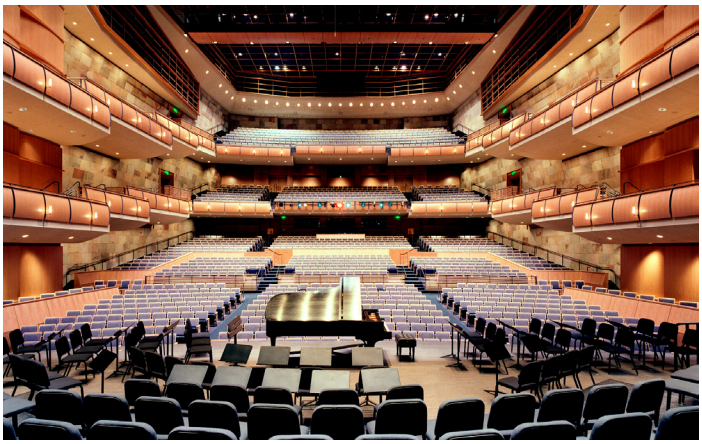
• **Flexibility:** Within the hour or across the day, rooms can change to meet the needs of faculty teaching in the spaces, whether through furniture, lighting, or technology.

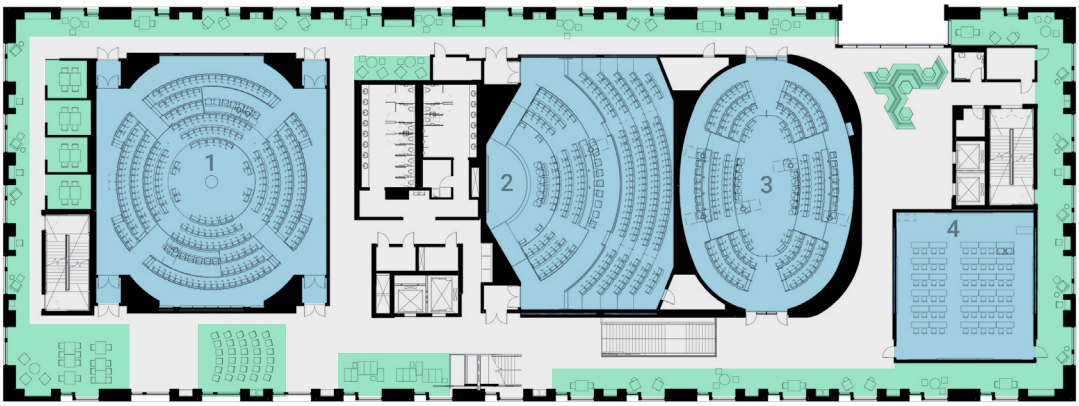
• **Adaptability:** The room should be able to shift over time as pedagogy changes, leveraging the original investment made by the University with low-cost adaptations available, such as the ability to bifurcate the room into smaller spaces.

Inspired by these active learning principles and other precedents outside academia, Bora drew on its depth of experience in the design of theatrical environments. In collaboration with performing arts consultant The Shalleck Collaborative, we generated ideas for a variety of spaces to share with OSU faculty, seeking to boost engagement in all examples, whether 60 seats or 600.

Several options were radical in their thinking about the spatial relationship between faculty and student, such as a 600-seat in-the-round classroom and a 200-seat "club lounge." We presented these ideas to the faculty at a second pedagogy charrette and asked them to make a collage of their ideal learning landscape. The faculty worked in small groups, identifying their preferred classroom makeup. Out of this session we were delighted to find that some of the most novel room configurations, including the in-the-round and parliament design, were unanimously selected to move forward.

BELOW (CLOCKWISE FROM LEFT) LINC parliament-style lecture hall (Photo by Steve Maylone); LINC 300-seat arena classroom (Photo by Steve Maylone); Bora's performing arts projects such as the UC Davis Mondavi Center for the Arts informed LINC's classroom design (Photo by Jeff Goldberg/Esto)





SECOND FLOOR PLAN

1 Small Arena Classroom
2 Fan Lecture Hall
3 Parliament Classroom
4 Flexible Flat Floor Classroom

To rally support for this innovative selection of classroom configurations, OSU's Associate Director of Technology Across the Curriculum, Jon Dorbolo, created a full-scale mock-up of the arena and parliament spaces, offering faculty the chance to give micro-lectures in these novel spaces to experience them firsthand. Initial skeptics turned into passionate supporters and went on to become early adopters of the project; many are now today's biggest users of the Learning Innovation Center, or LINC, as it eventually came to be called. Faculty involvement and extensive research into the fundamental aspects of teaching and learning deeply influenced the final design solution.

Today, LINC holds several first-of-its-kind learning environments. The largest of these spaces is the 600-seat arena, where students are never more than eight rows from their professor. In the 300-seat arena classroom, people can easily see one another and are only 25 feet from the center of the room, where the professor walks about without a microphone. In the 175-seat parliament room, the space is intimate and ideal for dialogue. In addition to case study rooms, several smaller flat-floor flexible classrooms also exist. In all these rooms, sophisticated visual displays and technology surround students from various sources and locations for an immersive, engaging learning experience.

BELOW Faculty explore a full-scale mockup of the arena-style classroom

SUPPORTING FACULTY IN THEIR NEW HOME

Academic leadership recognized the building would need additional programming to be a success. Becky Warner and Lois Brooks understood that for these novel classrooms, faculty would need support to fully maximize its spaces in the long term. Thus, the Integrated Learning Resource Center (ILRC) was born—a combination of OSU's Center for Teaching and Learning, Classroom Technology Services, and Technology Across the Curriculum. Located on the fourth floor of LINC, this Center provides wrap-around services for faculty who teach in the building—from help with instructional design to technology support. A "sandbox" space enables faculty to pilot new teaching methodologies and technology before going into the classroom. In addition to providing ongoing support, the ILRC is also home to a longitudinal research project tracking the learning outcomes of the spaces in LINC.

THE INFORMAL "LOOP"

Across all our academic projects, we see increased demand for informal study beyond the classrooms. Today's student expects a landscape where learning happens everywhere, and with varying levels of formality. They want to continue conversations with their peers and faculty beyond class time, boosting their understanding of the material. Intent on providing informal learning space for students to augment the formal learning happening in the building, OSU programmed space for an additional 650 informal study seats, or 30% of the formal classroom seats, to be present in LINC.

In addition to the need for informal space, the project was challenged by having to move so many people through the building during class changes. LINC's total seat count is 2,500 seats, or 25% of the classroom seat inventory of the entire campus. Never had such a concentration of students been in one place for a single class change. With 2,500 students in seats and 2,500 students waiting to get into those same seats, there would be 5,000 people moving through the building in a compressed amount of time. Ease of movement became a critical design issue to address as we looked to organize the 13 classrooms that would be part of LINC.

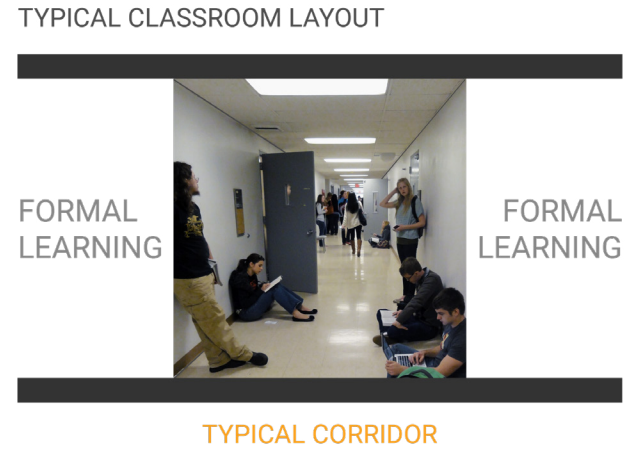
ABOVE Students engage casual study areas along LINC's peripheral loop (Photos by Steve Maylone)

RIGHT Unlike many typical classroom buildings, LINC places formal learning at the building's center, surrounding it with an informal "loop" of multi-use spaces

To address both the informal space needs and the congestion challenges, Bora created the informal "loop"—a series of smaller, multi-use spaces that surround the formal classrooms occupying the center of each floor. For the building organization, the classrooms become the "flow regulators," objects within a heavy circulation corridor that split the crowd and regulate the direction of traffic. This strategy is used often in airport design—evidenced by retail kiosks, coffee carts, and moving walkways placed in the center of the circulation—where many people appear at once and need to move quickly. The loop concept gave users easy access to and from the classrooms while providing informal spaces immediately adjacent to the learning environments. As an extra benefit, we discovered through early energy modeling with our partner PAE that the loop surrounding the formal spaces provided enough "insulation" to eliminate a classroom heating system—saving costs and energy.

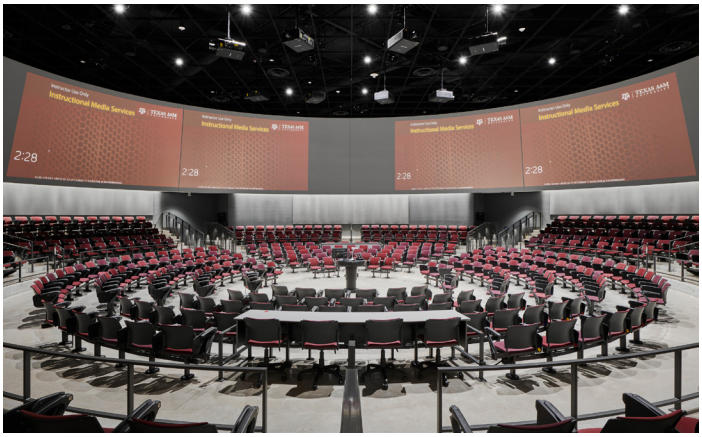
MERGING WITH THE CAMPUS CONTEXT

Exterior design. The OSU campus is listed on the National Register of Historic Places, with its building designs regulated by a local Historic Review Commission on behalf of the National Park Service. Given the campus design guidelines and historic review, the exterior envelope of LINC acts as a contextual "wrapper" slipping over the active interior with a quiet and consistent architectural vocabulary of large, punched windows. We worked within the material vocabulary of the campus but added small details to reflect the interior activity. Brick banding is more concentrated at LINC's base, giving a sense of gravity, but dissipates as the building rises–an acknowledgment of the decreasing density of people on each floor. This wrapper was designed to be "active" as well, with deep bay windows on each floor providing seating, study carrels and writing nooks. A large framed opening faces Jefferson Street to the north, while a series of doors open to the south onto the large new quad, relieving pressure from the building's two largest classrooms—the 600- and 400-seat rooms.



> **This remarkable addition to our campus has proven to be the most popular academic classroom building for students and faculty alike, and it will positively shape learning outcomes for our OSU community for generations to come.**
>
> Edward Ray, Former OSU President

A new quad on an historic campus. Designed around a series of green quads, OSU's historic campus was designed by landscape architect John C. Olmsted. As part of the LINC project, a new quad was created–continuing the westward expansion of campus and providing new gathering space for students. Working with Walker Macy, we created a space that would accept the many avenues of flow to the building from all parts of the campus. The quad also acts as a bridge to the Austin School of Business to the south while providing a popular venue for career fairs, outdoor student gatherings, and outdoor classes.



FOUR YEARS LATER: DESIGN OUTCOMES

Since its opening in 2015 LINC has been completely oversubscribed, with a steady waiting list for instructors hoping to get into the building to teach. From the inception of the project in 2011 to 2020, first-year retention rates have increased from 83.4% to 86.8%. When comparing LINC's 600-seat arena to its "sage on stage" counterpart at Milam Hall on campus, numbers show that student withdrawal and failure rates within the 600-seat arena classroom have seen a 30% reduction. Students regularly take family members to the building on parents' weekend, proud of the academic space in which OSU has invested. Beyond sharing LINC with family, students recently co-opted the 600-seat arena on a Sunday night to host—perhaps the greatest compliment of all to the design team—a rave party with slick A/V technology and killer acoustics.

LINC is widely celebrated as a place of connection and community and has gone on to serve as a design prototype for learning environments at institutions across the country. Building upon the success of LINC at OSU, Bora designed "version two" of many of these interactive learning spaces at Texas A&M University's Innovative Learning Classroom Building, completed in 2020 (Perkins & Will served as Architect of Record). Since then, several universities, including the University of Michigan and the University of California at Riverside, have incorporated similar designs into their facilities. These top research universities now have the ability to host engaged learning for large entry-level courses, maximizing the dialog and exchange so vital to student success.

From the creative process stemming from research and out-of-the-box thinking, to Oregon State University's enthusiasm to take a bold chance on something new, LINC came together as a "dream project" that will continue to shape the learning landscape for years into the future.

ABOVE LINC's learning spaces went on to inform our design of the Innovative Learning Classroom Building at Texas A&M University (Photo by Peter Molick)

LEFT An active interior lies within LINC's quiet brick exterior, designed to complement OSU's historic campus character (Photo by Steve Maylone)