PLC 7 Report
Campus Learning Spaces

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As recently as a decade ago, the classroom was primarily the locus of higher education learning. However, the world-wide web and its accompanying network-based applications has transformed learning in ways that have shifted learning from a classroom, library, and/or faculty office to a range of spaces in which learning occurs. Virtual spaces, informal spaces, outdoor spaces, and residential spaces, now compete with the traditional classroom as venues in which learning takes place.

Higher education has responded with a radical shift in learning theory. Malcom Brown, Director of Academic Computing at Dartmouth College described this shift:

> "A shift in the teaching and learning paradigm is well under way, moving away from a transmission paradigm to a constructivist paradigm. In 1900, basic literacy skills included reading, writing, and calculation. *Knowing* meant being able to remember and repeat, which was appropriate to an industrial age in which practices changed slowly (at least by today's standards). Workers anticipated having a single profession for the duration of their working lives. Education was based on a factory-like, "one size fits all" model. Talent was developed by weeding out those who could not do well in a monochromatic learning environment.
>
> The postindustrial age is characterized by rapid change. Literary skills now include critical thought, persuasive expression, and the ability to solve complex scientific and organizational problems. Knowing now means using a well-organized set of facts to find new information and to solve novel problems. In 1900, learning consisted largely of memorization; today it relies chiefly on understanding." (Brown, 2016)

Higher Education has responded to shifts in the philosophy of learning and the meaning of learning spaces through expansive research in architectural pedagogy, planning, design, and instructional support. Mike Keppell (Pro Vice-Chancellor of Learning Transformations at Swinburne University and colleagues wrote:

> "Higher education is facing a renaissance in terms of its approaches to teaching and learning and the use of physical and virtual spaces. This book will address the question of how higher education institutions and administrators need to re-conceptualize, re-design, and rethink the use of space for students entering university in the 21st Century. Higher education institutions are no longer defined by the physical boundaries of their traditional campus but the entire student experience, whether that be negotiating the physical corridors of the campus or connecting to virtual environments. The design of spaces to support the generation of knowledge by students themselves is an important and neglected

field. With lectures and tutorials still predominant in higher education, the organisation of space and time configures students as receivers of knowledge until the point of graduation, at which time they are expected to produce knowledge of their own. Rather than lecture halls with rowed seats being the predominant physical learning space for learning and teaching in higher education, learning spaces need to include: physical/virtual, formal/informal, blended, mobile, personal, and professional learning spaces that need to consider flexibility, adaptability, and time. They need to mirror contemporary learning and teaching strategies that emphasize independent and peer-based learning in both physical and virtual learning spaces, and need to account for how students perceive and utilize space in higher education settings. In meeting these priorities, it is essential for universities to support synchronous and asynchronous, multi-disciplinary, multi-campus, and inter-institutional collaboration amongst students, between students and teaching staff, and amongst teaching staff." (Keppell et. al, 2011)

Learning Spaces at SOU

Research in the field suggests that learning spaces in higher education should be considered in terms of **design, intent, and technology**. Further, research reveals that much of what is understood about learning spaces can be scaled from new innovative construction to simple pedagogical shifts. In considering Southern Oregon University, PLC 7 identified several key themes for learning space exploration:

1. **Active and accessible learning spaces**- How might our "classroom" spaces be re-imagined to capture contemporary research in how learning spaces operate, how students actively come to know, and how might all students have access to such spaces?

2. **Maker Spaces**- A growing response from students demands we formalize hands-on education linked to real-world challenges. Maker spaces incorporate this shift into spaces that combine "machine shop" with "academic computing".

3. **Informal Learning Spaces**- Learning spaces research argues that hallways, cafes, seating areas, and dorms are as much a component of higher education learning as is the classroom. How might SOU design collaborative and virtual spaces into our physical structures?

4. **Pedagogical landscapes/Outdoor Learning Spaces**- Students expect a university campus to look different from other places. Students expect that outdoor spaces speak to quality of life, the role of students as citizens, and the ways in which the campus models its formal teachings. How might SOU formalize its campus as a pedagogical landscape?

5. **Campus/Community Engagement Spaces**- Institutions are increasingly recognizing the potential of the broader community to serve academic

interests. These interests promote collaboration, external funding, employment, and networking. How might SOU develop shared spaces with the community (perhaps downtown) that promote such engagement?

6. **Community/Region as a learning Space**- Beyond Ashland, SOU regularly attempts to connect students to the broader region. This level of community connection and service requires formalized transportation and risk management structures. How can SOU better meet this increasing demand?

7. **Union or common Space**- Learning space research frequently remarks on the role of a "student union" as a component of the campus learning space network. However, SOU students, staff, and faculty regularly question the ways in which the Stevenson Union utilizes space as an extension of campus.

Unfortunately, the range of extent of learning space research reviewed by the PLC made it difficult for our group to explore all areas found relevant for our campus at this time. The research that follows represents initial exploration into several of the above-identified opportunities.

Active and Accessible Learning Spaces

Active Learning and Learning Spaces

Active learning is often defined in terms of its opposite; passive learning in which students are just listening, often in a traditional lecture format. According to Bonwell and Eison,

> …students must do more than listen: They must read, write, discuss, or be engaged in solving problems. Most important, to be actively involved, students must engage in such higher-order thinking tasks as analysis, synthesis, and evaluation (Bonwell & Eison 1991, p. iii).

Active learning encompasses a wide range of pedagogical strategies, including small-group activities, simulations, role-playing, case studies, journal writing, problem solving, collaborative assignments, service learning, and in-class writing. Perhaps more importantly, active learning is strongly associated with reduced failure rates and higher test scores, as well as increased retention and even enrollment (EAB Facilities Forum 2016, p. 9).

Because passive learning is so strongly associated with traditional lectures, it may be surprising to note that active learning can happen in any space – pedagogical requirements do not generate architectural requirements. There is no reason why small group activities cannot be successfully administered in a traditional lecture space. That said, some learning environments are more conducive to active learning principles and strategies. Hence the (relatively) recent interest in active-learning classrooms.

One of the hallmarks of active-learning classrooms is an emphasis on technology, either in terms of technology built into the space or in term of spaces that facilitate the use of students' own devices. Generally speaking, technology in active-learning spaces is about facilitating hands-on collaboration, as well as providing another way for instructors to present course material. Though they usually accommodate fewer students per square foot, active-learning classrooms can range from small classes with 10-20 students to large seminars with hundreds of students.

Another hallmark of active-learning classrooms is flexibility; chairs, tables, whiteboards, even lecture podiums and walls are all mobile. In part, this reflects a desire to create spaces that different instructors can make their own, as well as a need to be able to accommodate a wide range of courses, both in terms of discipline and class size. Flexibility is also rooted in the concept of active learning itself, which utilizes numerous pedagogical strategies, each of which may be best implemented with different classroom setups. Finally, flexibility allows multiple instructional approaches to be used in a single classroom session, from traditional lecture to multiple active-learning strategies, giving students with different learning styles more opportunities to engage with the course material.

Both active learning pedagogies and active learning spaces scale well. Instructors can completely redesign their courses around active learning, or judicially incorporate active learning techniques into a traditional, lecture-based course. Similarly, institutions can spend many millions of dollars on specially-designed active-learning facilities, or a few thousand on tech-enabled, flexibly-furnished classrooms. The main barrier isn't so much money as the space required. As noted above, active-learning classrooms are less space efficient than traditional classrooms. A room that accommodates 30 students in a traditional set-up may accommodate 20 in an active-learning configuration.

Accessibility and Learning Spaces

To make learning spaces accessible to the greatest amount of people, universities are increasingly using aspects of Universal Design (UD). UD was coined by architect R.L. Mace (1985) to describe the design of products and environments to be useable by the maximum range of people possible. Rather than focusing on "special" or "accommodating" adaptations, Mace (1985, 1) sought to design architecture in affordable ways that were "both attractive and functional for all people, disabled or not."

This approach is not about finding a one size fits all, rather it seeks to create learning spaces that are accessible, barrier-free, inclusive, and somewhat adaptable for a variety of bodies and learning styles. While UD stems from disability movements, Mace and others highlight that a greater number of individuals may benefit from this approach. The increasing number of students with disabilities pursuing higher education, veterans returning to college, and our aging population are all additional reasons to utilize UD. When creating these spaces, we may consider the adaptability and inclusiveness of the learning spaces for people with:

visual impairments,
hearing impairments,
mobility impairments,
learning disabilities,

health impairments,
psychiatric impairments,
temporary impairments, and
speech impairments.

In addition, learning spaces may be adaptable for various body sizes, English language learners, and noisy environments.

In thinking broadly about the application of Universal Design to physical spaces at SOU, we recommend drawing on Scott, Shaw, & McGuire's (2001) nine guiding principles:

1) equitable use,
2) flexibility in use,
3) simple and intuitive,
4) perceptible information,
5) tolerance for error,
6) low physical effort,
7) size and space for approach,
8) a community of learners, and
9) instructional climate.

Salmen (2011) explicitly addresses the benefits of UD for academic institutions and provides several examples of reimaging learning spaces. Building on this, below are some examples of how Universal Design might be used at SOU.

A. Publishing accessible routes around SOU's hilly topography using signage, brochures for guests/visitors, and publishing on the website. For example, currently students and their families are taken on inaccessible tours (e.g., having to take stairs) around campus, and it is upon individuals to ask for "special" accommodations. This approach disregards individuals with hidden disabilities and sends a message of exclusion contrary to SOU's statement of being "committed to diversity, inclusion and sustainability".

B. Furnishing classrooms with a variety of chairs, tables, and desks that accommodate various bodies and abilities. This also may then accommodate various pedagogical designs. While classroom maximums are often based on desks/tables in rows, we may need to rethink the number of bodies in the classroom for different types of set ups (e.g., U shaped, circles, etc). (See pictures of classrooms in Harvard Law School)

C. Rearranging and furnishing potential learning spaces beyond the classroom, such as hallways and other gathering spaces.

D. Installing technology in the classroom so it is easily accessible to a variety of people.

E. Selecting technology that meets the needs of instructors' different pedagogies and students' various learning styles.

F. Encouraging faculty to utilize UDL in their course development and implementation.

G. Imagining and planning new buildings using UD. Although our new building codes must meet a minimal level of accessibility according to federal laws [e.g. Americans with Disabilities Act Standards for Accessible Design (US Department of Justice, 1994, rev.), Fair Housing Amendments Act Accessibility Guidelines (U.S. Department of Housing and Urban Development, 1991)], UD addresses how redesigning spaces may make it accessible to a greater body of people.

H. Revisiting existing buildings to ensure they meet ADA requirements, at a minimum. E.g., ensure that electronic doors are in working order, add ramps to certain entrances, confirm elevators work, and mark accessible routes around campus.

Maker Spaces

Students are coming to campus very comfortable with technology and expecting to find it available in all areas of campus. Classrooms are no longer the only learning spaces on campus. Learning now takes place wherever the learner is inspired. Therefore, campuses now need to be just as intentional with the design of informal learning spaces as they are with traditional learning spaces. If students do not find spaces that inspire them, they will leave to find spaces that do. Valuable learning takes place in informal learning spaces based on conversation, social interactions and team projects.

Maker spaces in higher education are a relatively recent phenomenon, with the origin of the university maker space traced back to MIT in 2001 (Barrett et al., 2015). A formalization of the DIY (do-it-yourself) movement, maker spaces are a combination of traditional machine shops and tools for rapid prototyping, such as 3-D printers and laser cutters (ibid). These spaces originated as supplements to engineering programs, but have expanded to complement design programs as well as act as incubators for entrepreneurship and innovation programs. The emphasis has been on hands-on informal learning and linking academia to real-world problems. In their survey of 35 universities with top-ranked engineering programs, Barrett et al. (2015) found that maker spaces are located both on and off campus, and while they can have an engineering focus, are typically available to students and faculty from other departments. These spaces are managed by students, faculty, staff or a combination of these groups. Maker spaces are commonly located in college libraries, but can be housed in various campus locations and in some cases, do not have a formal structure but are part of a "culture" or "ecosystem" (MakeSchools, 2017).

Aspirational examples of university maker spaces include Yale's Center for Engineering Innovation and Design, with 8,500 square feet of classroom, studio and workshop space (MakeSchools Yale, 2017). Yale students use the space to "design and build rockets, autonomous robots, sailboats, hybrid race cars, Mars rovers, water systems for developing nations, genetically engineered solutions, … and software" (ibid). The Jacobs Institute for Design Innovation at UC Berkeley is a 24,000-square foot building that houses design studios and equipment labs, and enables students to have hands-on experience in prototyping, iteration and fabrication (Jacobs, 2017). Students can work on individual projects, engage in team-based collaborative learning, or take university classes such as "Hacking for Impact: Tackling Societal Challenges with the Lean Launchpad Method."

Both the University of Oregon and Oregon State University support maker culture in a variety of ways. OSU's Austin Venture Lab focuses on experiential classes that support student entrepreneurship and a year-long program that includes launching a business, developing products, marketing ideas and building teams (OSU Austin Lab, 2017). The affiliated DAMlab Makerspace gives students the tools to make prototypes and prepare their ideas for manufacture.

Another facet of maker space is the OSU Craft Center, which occupies 10,000 square feet of studio space, and offers programs and classes in ceramics, photography, textiles/fiber arts, silk screening and printmaking, glasswork, jewelry and metalsmithing, and woodworking.

University of Oregon's School of Architecture and Allied Arts, and the Product Design Program in particular, are the loci of a very strong maker culture, and include facilities for metal fabrication, machining, ceramics, woodworking, and printmaking. There are labs for animation, 3D scanners and printers, large-scale printing and lighting studios. The DeArmond Maker Space has recently opened up in the Allan Price Science Library and provides equipment for checkout such as 3-D printers, industrial sewing machines, soldering irons, and electronic devices (UO Libraries, 2017). The new Craft Center at UO occupies a large space in the student union with programs and classes in ceramics, photography, fiber arts, printmaking, glasswork, jewelry and metalsmithing, painting, and woodworking.

The California State University system offers a variety of maker spaces that could be models for SOU. The libraries at CSU San Bernardino and San Francisco State University make available 3D printing, milling, electronic and virtual reality equipment (CSUSB, 2016; SFSU, 2017). Perhaps most promising for SOU is the Creative Media Lab at San Jose State University, which offers stations at King Library for video editing, audio editing and gaming/animation (SJSU, 2016). The SJSU library also offers 3D printers and maker technology equipment for checkout.

There are a number of possible ways to implement and house maker space at SOU, which could enhance our strengths in EMDA, the Business program and applied research, and could provide students with activities that would encourage more time on campus. The incubator model at OSU could be incorporated into the Business program and could give students the ability to take their innovative ideas from conception to manufacture and marketing. Another option is to take San Jose State University's approach, and encourage student invention and creativity by providing video editing, audio editing, virtual reality and gaming/animation equipment. A third possibility would be to establish a craft center that would allow for hands-on experience in a more recreational form, giving students the opportunity to stay on campus longer and providing them with low-cost extra-curricular activities.

Options for housing maker spaces include existing buildings at the Ashland and Medford campuses. One possibility is to follow the California State Universities and create a maker center in Hannon Library. The procedures are already in place for checking out equipment and supporting a computer lab with editing, game creation and animation software. An incubator maker space could be located in Hannon Library, in Central Hall along with the Business program or at the Higher Education Center. A craft center could be based in a re-configured Cascade Hall or the basement level of the Stevenson Union.

A final option for maker space involves partnering with the applied research centers, SOULA (SOU Lab of Archeology) and SOURCE (SOU Research Center) to create a large campus space devoted to faculty and student collaboration. SOULA and SOURCE are project-based organizations that utilize faculty and student teams to solve real-word problems, and could provide the template for similar interactions in the maker space. Computing Services East would

be an ideal building, as it already has the computer backbone and large open two-story structure that would meet the varied needs of these different organizations. Students could then use Computing Services East as a "one-stop" location for academic engagement that has real-world applications.

Outdoor Learning Spaces:

The word campus was first associated with the college grounds of Princeton University in the 1770's (Eckert, 2012; Turner 1984). Early university designers expressed an interest in the development of an environment that would enable a population to devote unlimited time and attention to learning, growth, and inquiry (Eckert, 2012, Gumprecht, 2007). While the structure and intent of a college campus has changed, Americans still expect a university campus to look different than other places (Gumprecht, 2007). Dober explained that students expect the college campus to express something about quality of life, the role of students as citizens, and the college campus as modeling its teachings (1996).

It has been noted that only about one fifth of a college student's time is spent in the classroom (Radloff, 1998). Early landscape and campus landscape designer, Fredrick Law Olmstead, saw this as reason to consider research on how physical landscape chapes human behavior. In his time, Olmstead operated within an environment in which the campus scene was considered as important as students' academic subject (Schuyler, 1996). In contemporary research, Kaplan and Kaplan have demonstrated extensively that well considered physical landscapes have the capacity to revive mentally fatigued and even emotionally weak students (Kaplan & Kaplan, 1989).

Much of the peer-reviewed research on outdoor learning spaces in the United States has focused on K-12 campuses. That work has focused on ways that campus can "breath life into concepts learned in the classroom" (Wagner & Gordon, 2010). This work also tends to focus on imaginative spaces, play spaces, environmental education, and ways to connect the campus to the surrounding community (Wagner & Gordon, 2010). However, substantial publication has emerged out of Australia in the past decade that argues that higher education is facing a renaissance in terms of its approach to the use of physical space (Keppell et. Al, 2011). In their summary of findings, they conclude, "Rather than lecture halls with rowed seats begin the predominant physical learning space for learning and teaching in higher education, learning spaced need to include: physical/virtual, formal/informal, blended, mobile, personal, and professional learning spaces that need to consider flexibility, adaptability, and time" (Ibid).

Research in the field of outdoor learning spaces includes regular reference to the following:

1. Active play structures (manipulatives, kinetic musical devices, sport/athletic grounds, stages, citizen research, gardens/farms, and mobile art.
2. Outdoor classroom spaces (pavilions, tiered seating, circles, climate controlled greenhouses, tree houses, and nature centers)
3. Outdoor laboratory spaces (arboretum, environmental learning centers, biological field stations, farms, and on-campus experimentation)

4. Informal Seating and Gathering (tables, benches, walls, landscape rocks, shade cloths, atriums)
5. Architectural/landscape pedagogy (interpreted signs on sustainable landscaping, pollinator gardens, alternative energy generation, rain gardens, tree plantings, and sustainable construction.

A True "Union" or Common Space on Campus

The student union serves as an inviting amalgamation of program elements that serve a diverse student body. The facility is a place that promotes intellectual and interpersonal skills and ultimately serves as a "hearthstone" of the campus community, it should be warm and inviting, collaborative and demonstrative of student interest. The idea of community and belonging is not tangible, but characteristics can be used to describe elements that makeup a good student union. Researchers (e.g., George Kuh's work on the National Survey of Student Engagement and an article by Holley Belch, Melinda Gebel, and Gerals Maas in a 2001 Journal of Student Affairs Research and Practice) have noted that improved facilities have a direct correlation to improved recruitment and retention of students. In a 2013 study conducted by the Association of College Unions International over 2500 professional staff and students agree that the student union greatly contributes to student satisfaction with the campus and integral in enhancing the campus environment and student engagement (Tierno, 2015). The following six principles suggesting what exists in the union that supports retention on college campuses:

1. Supports the Academic Mission of the Institution
2. Enhances Communication of Community Values
3. Is a Diverse Space on Campus
4. Is a Community Center
5. Is a Welcoming Place
6. Celebrates Traditions

Current efforts for student unions are designs that create openness and transparency; a place to be, be seen, and observe; a space that is inherently flexible. Modern unions offer vibrant and light-filled interior spaces for social gathering, studying and access to many programs and services. A design that focuses on a seamless transition from inside to outside. Interdisciplinary programmed elements that allow student populations to easily flow in, around and through the building. This can be achieved by having the union being a shortcut to walk through rather than around to get to various places on campus.

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Appendix (Select Video and Image Collection)

Active Learning Center (Purdue University)
https://www.youtube.com/watch?v=zp9biA8NCVc

Transforming Zabel Hall
https://www.youtube.com/watch?v=r3CXUuhhB48
Zabel Hall is the primary classroom building for EOU's College of Business and College of Education. The comprehensive renovation of Zabel Hall balances deferred maintenance and system upgrades with revitalizing the building's classrooms to create vibrant learning spaces that have ample natural light, proportions that allow for flexibility in teaching, and incorporate both traditional and modern instructional tools. The transformation includes a revitalized building entry, full window replacement, addition of a student commons, and informal learning spaces to encourage interaction between students and faculty.

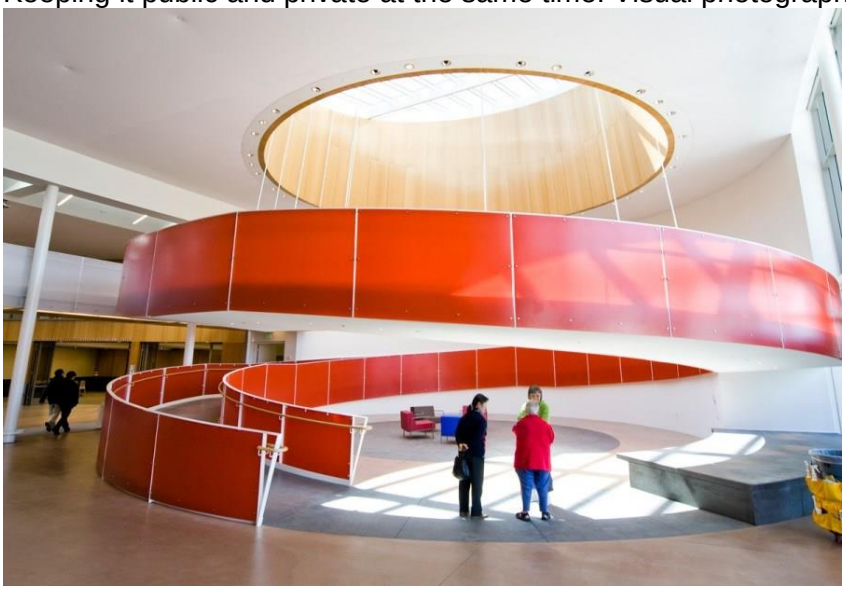
Building a Classroom in 2 minutes
https://www.youtube.com/watch?v=btYtAZrPhec

I appreciated that this design links two buildings and provides visibility into the hallway/bridge. This displays how design can build community-not only by building a connection/shortcut but also creating a showcase to watch the campus community as part of the landscape.
This might be great between Taylor and Central or between Britt and the Union, or in our next structure...rebuilding the Union :)

More outdoor performance spaces. There is a tremendous opportunity for this in Raider Village. The concept of a built in city square or seating area. A round arena to promote informal gathering outside and outdoor lectures.

Open spaces with lots of versatile casual seating where students can see into offices and offices can see students working, playing, engaging.

Keeping it public and private at the same time. Visual photographs of students, faculty and staff.



Clearly accessible space within the context of natural light and collaborative space

Active and accessible learning space

Traditional lecture hall with collaborative table space

Making use of collaborative space in laptop context

Flexible and comfortable learning space with technology advantage


Collaborative and accessible learning spaces


Collaborative work space in science building

Outdoor Seating on campus

Campus circular seating for classes/performances

Maker Space