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EVERY SPACE IS A LEARNING SPACE

Encouraging informal learning and collaboration in higher education environments

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EXECUTIVE SUMMARY

Learning space design, approached from a holistic perspective, takes into account the spectrum of learning activities and the variety of environments necessary for students to optimize their academic experience. The development of informal student spaces supports formal pedagogical approaches and environments. These unique spaces provide students with a range of options to engage in individual study as well as group collaboration. Well-designed spaces allow students to engage in a richer educational experience. This paper presents a review of literature and case studies of the importance of informal learning environments in higher education.

INTRODUCTION

Higher education institutions continue to face pressure from socio-economic forces (i.e., rising costs of education), evolving pedagogies (teaching practices), and ever-transforming technology. Research shows factors such as technology are drastically changing the ways in which students learn (Richtel, 2012). Additionally, the student population continues to grow in number and diversity. Today's colleges and universities are challenged with serving students who possess a vast range of skills, interests, and learning preferences. Current research also reports student preferences for a variety of learning settings and activities, while favoring those that support collaboration, hands-on learning, direct interaction with faculty and peers, and a range of formal and informal learning experiences. Higher education institutions have found flexible learning spaces and informal, collaborative 0environments (often located just outside of the traditional classroom) successfully promote student engagement in the learning process (McDonald, 2013).

CHARACTERISTICS OF LEARNING AND COLLABORATION

Learning is a social process often characterized by students actively seeking discussions of course material with their peers, ultimately contributing to a deeper learning experience (Bickford & Wright, 2006). Engaging in this form of social learning and

collaboration has been shown to benefit the learning process (Bennett, 2006). Collaboration involves interactions between students and/or faculty that facilitate learning, and usually occurs between a pair or within a small group of people working cooperatively toward a common goal.

Precedent studies have supported the success of group problem solving as a supplement to individual problem solving (Bickford & Wright, 2006). This type of learning activity also provides students with opportunities to consider diverse perspectives, share information and resources, and participate in interdisciplinary experiences (Bennett, 2006; Bickford & Wright, 2006; O'Neill, 2013).

Although mobile and virtual means of communication continue to evolve, allowing communication to occur with very few physical constraints, the modern student still appreciates "meaningful, face-to-face contact" in addition to technological formats (O'Neill, 2013).

CHARACTERISTICS OF THE MODERN STUDENT

Student demographics and characteristics (e.g., learning styles, backgrounds) offer personal influences on the learning process. Additionally, preferences for technology influence how students seek communication and engage in their education experience.

Informal spaces, as shown here at Gustavus Adolphus College's Beck Academic Hall, provide opportunity for students to be social and connected with their peers while accommodating individual preferences (e.g., comfortable seating, access to daylight, and writing surfaces).

Demographics

The majority of students attending higher education institutions still belong to the traditional student demographic: 18-22 years of age, high school graduates, full-time students attending a 4-year institution (O'Neill, 2013). In 2011, The National Center for Education Statistics reported that 57% of students enrolled in degree-seeking postsecondary institutions were between the ages of 18–24, 23% of degree-seeking postsecondary students were between the ages of 25 and 34, and 16% were 35 years or older (NCES, 2011).

While the majority of student populations belong to the traditional demographic, institutions have seen an increase in age diversity over the past decade. Between 2000 and 2010, the percentage increase in the enrollments of students over the age of 25 (43%) exceeded the percentage increase in the enrollments of students under the age of 25 (34%). This trend is expected to continue over the next decade.

Higher education institutions are also experiencing an increase in students who commute, transfer students, part-time students, those returning to school, students with minority status, and students studying abroad from across the globe (O'Neill, 2013). These trends present an increasing demand for higher education institutions to provide spaces for a wider range of diverse student types to interact, engage in the learning process, and feel comfortable on campus.

Technology and Connectivity

Looking beyond changing demographics and diversity on campuses, institutions are also being influenced by our technological society. Ever-changing media and technology have completely transformed the way students access, process, and share information. Today's learners are exposed to an enormous range of technology and carry the expectations that a large amount of academic work will be conducted via computing. Creating and sharing personal content through the use of portable devices and social networks also continues to grow. These technology-savvy and highly-connected students find alternative methods of communication highly accessible.

Participatory Learning Experiences

Despite their comfort with technology and communication devices, face-to-face social interactions remain important to a student's experience, including collaborative and peer-to-peer learning (Weaver, 2006). In fact, research affirms interaction with faculty, staff, and peers is one of the most important influences on student learning (Dittoe, 2006; Kuh, Kinzie, Schuh & Whitt, 2005). In addition to being highly social, the majority of today's learners prefer active, participatory, and experiential learning (Oblinger, 2006). Students seek to participate in the construc-

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tion of knowledge, rather than taking a more passive act of simply receiving knowledge. Additionally, these approaches to learning contribute to better outcomes (Long & Holeton, 2009; Leland & Kasten, 2002).

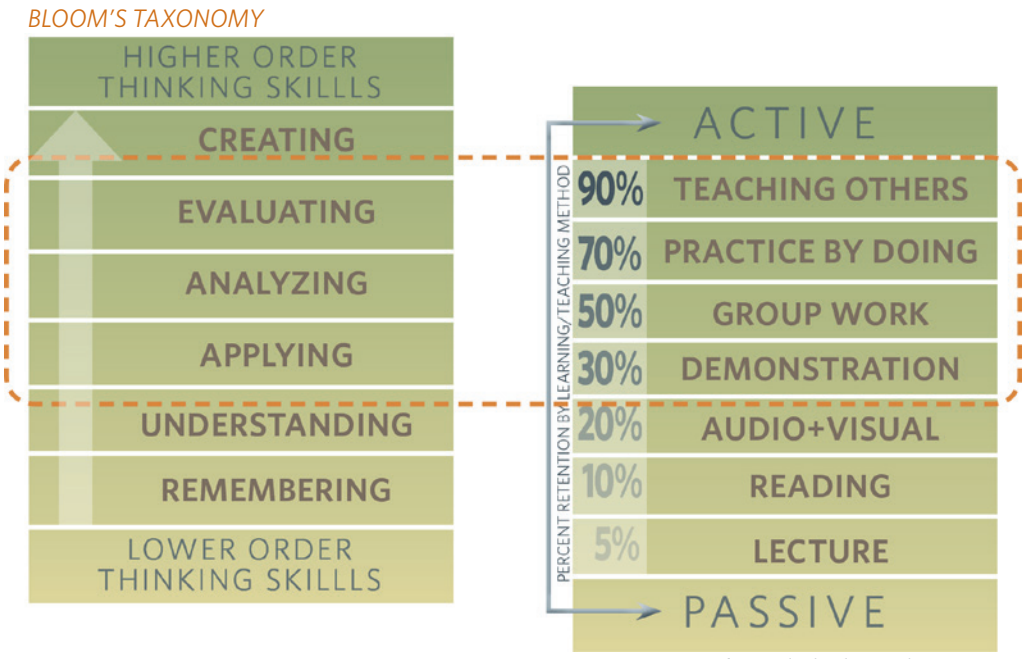
LEARNING FRAMEWORKS

Several frameworks exist and offer themselves as working tools to understanding the learning process. For example, a widely accepted framework, Bloom's (Revised) Taxonomy, presents on ordering of activities related to higher order thinking skills (Anderson & Krathwohl, 2001). Correlating Bloom's Taxonomy with pedagogical approaches, the Institute for Applied Behavioral Science (2005) provides a relationship with active-based pedagogies resulting in a higher percentage in retention of course material (e.g. teaching others, practicing by doing, and group work) (see Figure 1). This learning framework is an example of how designers gain valuable insight to create innovative space strategies to support modern learning. A variety of spatial features can enhance active learning approaches, both in and out of the classroom, to promote the types of interactions that achieve optimal educational outcomes.

CHARACTERISTICS OF THE MODERN LEARNING ENVIRONMENT

Educational institutions are seeking to provide a variety of learning experiences — from structured, formal, teacher-led experiences to moments of less structured, peer-to-peer, informal or self-directed learning (Wilson, 2009). To accommodate these evolving pedagogies, environments can be designed to promote learning as an activity; support collaborative and formal inquiry; offer a personalized and inclusive environment; and be adaptable to meet changing needs (Joint Information Systems Committee, 2006).

Learning environments also can promote interdisciplinary inquiry, multimodal and multi-method teaching and learning activities, and place the learner at the center of the education experience (Oblinger, 2004). In addition to supporting a diversity of academic activities, these spaces should remain flexible, comfortable, and appealing to students (Siddall, 2006). Using the environment as a working tool, institutions can respond to changing student needs by exploring opportunities for supplementing formal classroom environments with innovative informal learning spaces.



Source: Institute for Applied Behavioral Science

Figure 1.
While traditional teaching/learning methods have been primarily focused on more passive approaches, modern pedagogies are evolving to explore concepts higher on the Bloom's (Revised) Taxonomy.

INFORMAL LEARNING SPACES

Jamieson (2009) defines informal learning as "course-related activity undertaken individually and collaboratively on campus that occurs outside the classroom." Informal learning is independent from teacher or faculty-led instruction, and generally can be understood as any supplemental learning activities that occurs outside of the formal instructional setting, including, but not limited to, course reading, assignments, and individual and group projects.

Through an understanding of the importance of less structured spaces for students to explore learning and engage in peer-to-peer activities, further emphasis is being directed at strategies to incorporate these informal learning spaces on campus environments. Due to the social nature of some of these informal learning activities, this type of learning has typically occurred in locations such as the library, student cafeterias, cafes, and other socially-oriented spaces. To address the increasing demand for more informal learning spaces, campuses are creating social hubs, internal "student streets," and other designated spaces that "promote both social and learning-related activity" outside the classroom (O'Neill, 2013).

Highly connected network of places with a mix of informal and formal learning spaces offers the physicial environment as a working tool in the learning process.

How can the physical environment support the ideals of informal learning? Keppell, Souter, and Riddle (2012) define informal learning spaces as spaces "that have been explicitly designed to encourage students to engage in both independent learning and peer learning that is often unscripted." Flexibility is an essential characteristic of spaces that successfully support informal learning, allowing students to adapt their physical environments to accommodate individual preferences. Spaces that include comfortable furniture, a variety of table sizes, limited basic kitchen amenities or access to food and drink, and a more casual atmosphere (in contrast to more formalized instructional spaces) tend to attract more students for informal learning activities.

Tibbetts (2008) observes students' perception of a sense of ownership over their space contributes to the success of informal learning spaces. Students typically spend more time in these spaces when they have the ability to change the layout of the space to accommodate a variety of needs.

Lounges, courtyards, study rooms, and other auxiliary spaces are often successful when located in close proximity to primary, specialized classrooms. These spaces should offer a variety of technology capabilities, charging/power connecting areas, and team work space with audiovisual equipment to create a "campfire effect," allowing students to plug in and immediately engage in activity. Additional features of successful informal learning spaces include round tables, mobile chairs, task seating, writable wall surfaces, screens, and expansive horizontal writing/work surfaces. Furniture, including "mobile boards, screens, low shelving, and temporary storage, can function as movable walls to divide a large open space into smaller group meetings areas and/or creative visual privacy" (O'Neill, 2013).

Providing an environment where students can think and digest information privately is important to balancing less private and open spaces. Adding small, intimate spaces for individual, focused work are also effective strategies.

Further considerations in the design of informal spaces is the transformation of students' needs throughout a semester. As a student progresses through the academic term, his or her needs may shift from requiring space for discussion with peers or collaboration on a group project to a demand for more self-directed or independent activity as exams approach. Ideal informal learning environments should be planned carefully with a high degree of flexibility to accommodate this range of activities.

MODELS OF INFORMAL LEARNING SPACES

The Modern Library — An Information Commons

The campus library has traditionally served as the higher education institution's "knowledge center." Due to the digitization of resources and the availability of these resources remotely, the role

of the library has been redefined. Higher education's shift toward student-centered, collaborative learning approaches also has drastically changed the demands of central campus facilities. Contemporary collegiate libraries now seek to offer a diverse environment, offering a combination of spaces that support individual activity and research as well as social learning activities. These new space accommodations are capturing floor area in libraries, replacing space previously dedicated to physical media collections and resources (Attis & Koproske, 2013).

The modern library, or information commons, provides students with a place to engage in learning outside of the classroom. Implementing new technologies, dedicated training centers, and the availability of food and beverage are all considerations for a modern library environment. The information commons is often perceived as an "IT-rich environment" (Lippincott, 2006), providing students with access to tools that support research, communication, and other learning-related activity.

Learning Commons

A more recent model of informal learning spaces is the "learning commons." The often centralized learning commons is conceived around the notion that the learning process is "enhanced when it occurs in a dynamic social context," and supports informal learning on a campus. Offering a wide range of academic opportunities, this model of informal learning space addresses a number of services, including skills training, multimedia development, and student IT support (Jamieson, 2009).

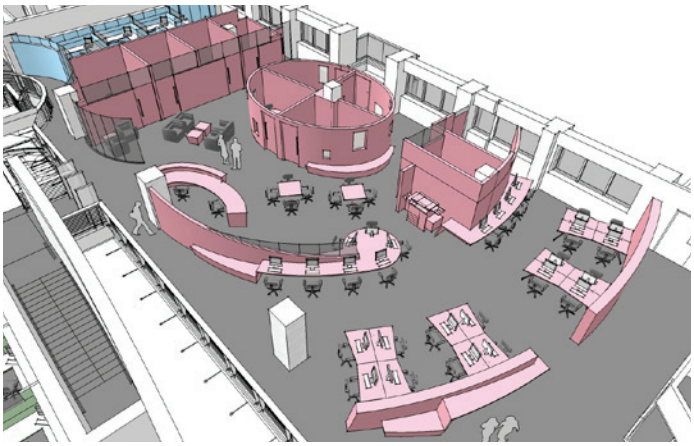
Potential services within a learning commons may include media labs, individual spaces for presentations, training, and distance learning, academic support services, career resources, and collaborative study areas. Flexibility, accessibility, and up-to-date technology are essential to the success of the learning commons. The learning commons can often be integrated into an existing space or exist as an independent informal social and learning place (Villa, 2013).

The Classroom — Beyond Four Walls

As evolving pedagogies are changing the landscape of classrooms, many of the strategies for designing informal learning environments are being incorporated in formal learning areas. In addition to good sight lines, acoustics, and indoor environmental quality, classrooms now feature design strategies, such as easily moveable furniture and perimeter-clad white boards, to successfully support group work and collaboration for more active learning approaches.

Leveraging Circulation Areas to Encourage Collaboration

Well-designed areas that are connected or adjacent to formal learning spaces is an effective strategy to provide informal options. Lounges, courtyards, and study rooms can be located in close proximity to classrooms, labs, and other formal environments to encourage continued discussion regarding course material after a scheduled class period.



Due to the digitization of resources and the availability of these resources remotely, the role of the library has been redefined. In addition to traditional library resources, the Augsburg Gage Center offers students integrated technology and collaboration areas.

"Learning streets" activate circulation spaces and encourage impromptu encounters among students and between students and faculty. "Front porches," or spaces immediately outside formal spaces, provide opportunities for conversations that continue classroom discussions immediately following class time (O'Neill, 2013). These collaborative spaces are most effective when planned as part of the overall program that includes formal learning environments and support areas to determine of square-footage allocation for a new facility or renovation.

CONCLUSION

Changing student demographics and expectations are applying pressure to colleges and universities to consider new approaches to teaching and learning. As pedagogical strategies influence faculty and student needs, the environment can have an important influence in the success of those strategies. Students can feel empowered to take ownership of their learning experience and engage in both formal and informal interactions with faculty and peers. Learning space design should be approached from a holistic perspective, taking into account the spectrum of learning activities and variety of environments necessary for students to optimize their learning. The development of informal student spaces will provide a range of options to engage in individual study as well as group collaboration. Well-designed informal learning spaces support formal academic approaches and allow students to engage in a richer educational experience.

CASE STUDY: UNIVERSITY OF MINNESOTA AKERMAN HALL RENOVATION

Stefnee Trzpuc, CID, EDAC, LEED AP, Sophia Skemp, Assoc. AIA, and Lucas Glissendorf, LEED Green Associate

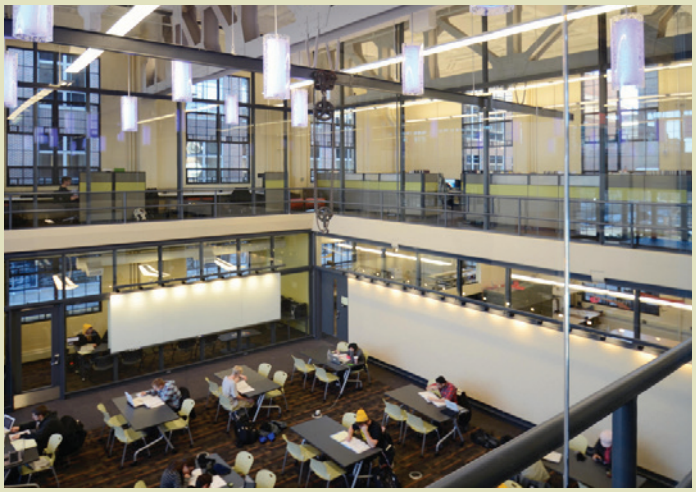
Overview

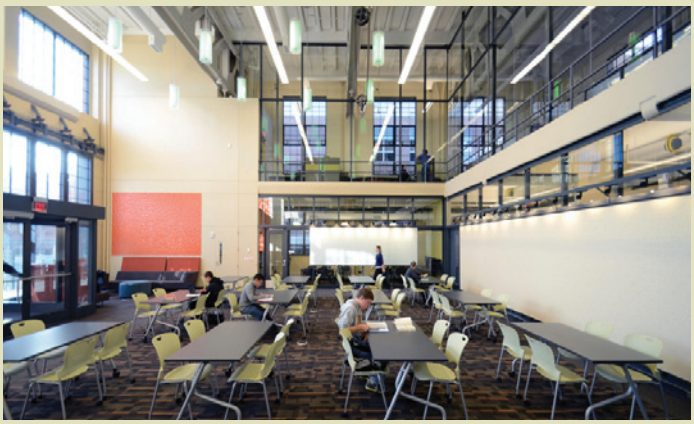
The Akerman Hall Laboratory renovation of a 1948 building on the University of Minnesota Twin Cities campus provides a variety of new teaching and research spaces, student collaboration and work areas, classrooms, state-of-the-art computer and model building labs, and a large student lounge and conference room. A focal point of the design is an adaptive reuse of a historic hangar as a light-filled study lounge surrounded by a two-story mezzanine created from the previous hangar space. This space provides open learning and workstation areas for students, break-out collaboration spaces, white board surfaces, and direct access to two of the facility's technology labs.

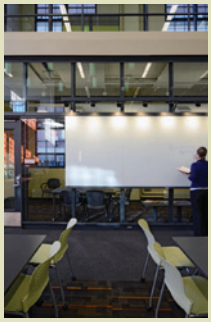
Environmental Research: Does Design Matter?

BWBR returned to the renovated informal study space upon the completion of the project to study how the new environment was being used.

Differences in activity were observed at two distinct points in the semester: during midterms week and a non-midterms week. Observed activity during midterms week reflected a higher demand for individual, focused, learning efforts, with less group and collaborative activity. Evidence of white board use was present. The sound levels remained low throughout the observed times, indicating a more "library" sense of space. Several students stayed in the space for long periods of time (i.e., an hour or longer),







Akerman's informal student space serves as both a destination for students to engage in individual and collaborative activity and also as a social space to gather between classes.

even bringing a lunch to eat during their study sessions. Activity was lighter in the morning, gradually increasing in the late morning and closer to lunch time.

Conversely, the activity observed later in the semester (after the middle of the term) was much different. While there were still students working individually in the space, a majority of the activity observed was collaborative. Several groups gathered at the tables, adjusting the tables and chairs to suit their needs. Large groups of students combined two tables to accommodate their group size. Activity included collaboration on projects or homework, preparing for class, talking casually, and organizing course material. Generally, students spent less time in the space than during the middle of the term. Activity was highest during the middle of the day.

The space serves as both a destination for students to engage in individual and collaborative activity and also as a social space to gather between classes. Students take ownership of this environment

through arrangement of furniture and often make use of the white boards. This informal environment has been a positive addition to this busy part of campus.

Methods

Our research team conducted behavioral observations to analyze how students were interacting with the new environment. During the observation, notes were recorded on how students interacted with the furniture, white boards, technology, and one another. Additionally, the amount of time students spent in the space and their choice of location was recorded on a floor plan. Observations were conducted during morning and afternoon hours and on multiple days during the week to obtain a broad sample of activity at various periods throughout the semester.

Findings

The renovated study space in Akerman Hall has found success as an informal student space by offering a convenient, easily accessible location in a highly visible section of this urban campus. Observations confirmed student preferences for flexible, easy-to-move furniture to accommodate both individual and group study activities.

Written by Stephanie McDaniel, AIA, LEED AP BD+C with contributions by John Strachota, AIA, LEED AP BD+C, and Tom Hanley, AIA, LEED AP., higher education planning professionals specializing in academic and science education environments. They are actively involved in leading organizations to discover innovative facility design strategies for higher education institutions. BWBR is a design solutions firm with expertise in planning and design for education facilities.

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CASE STUDY: NORTH DAKOTA STATE UNIVERSITY STEM EDUCATION BUILDING

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Overview

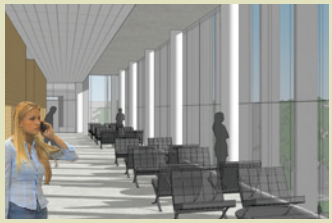
The new state-of-the-art, 111,000 gross-square-foot STEM Education Building will create a new identity for the North Dakota State University campus to attract and support STEM undergraduate students in an interdisciplinary working environment. The facility will provide environments that support a variety of learning styles as well as break down departmental barriers by providing highly flexible science spaces for use by the entire campus.

Spaces such as informal gathering areas and group study rooms dedicated to student collaboration are conveniently distributed throughout the facility. These flexible spaces will enhance the NDSU STEM learning experience and offer a choice of environment for specific individual student or group needs.

Environmental Research: Influencing the Design

In collaboration with an NDSU graduate student, research was conducted through on-site campus observations and simulations for how various design strategies would be employed. Observations of popular campus study and lounge spaces throughout campus informed the design team for how current informal spaces are being used as well as spatial elements and attributes common among those areas. The sponsored student research also contributed a literature review focused on student collaboration and the importance of informal learning spaces in higher education.

Special thanks to NDSU graduate student Matthew Dunham for his contributions to this research effort.



Implementation

The research provided real-time insight for informed design decisions early in the design process. Examples of strategies as a result of the research include:

- Semi-private group study areas (providing a sense of privacy and ownership while in a larger open environment)
- Flexible seating and furniture arrangements for a variety of group spaces and collaboration options
- White boards and integrated technology for "plug and play" group spaces
- Balancing open, active study spaces with quiet, reflective spaces for individual focused work

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