Colleges worldwide are revamping campus spaces to facilitate the trend toward collaborative learning. An architect offers his insights on how to handle the redesign successfully. By Peter C. Lippman

DESIGNING COLLABORATIVE SPACES

TODAY, UNIVERSITY spaces are being reimagined to embrace new ideas about why, how, where, and when people learn. Instead of viewing the classroom as a one-to-many teaching platform, schools are rethinking these spaces to enable small groups to work on projects collaboratively. The changes don’t stop at the classroom door either, since learning isn’t confined within a class’s four walls. Outside class time, students are coming together in smaller social groupings, both formally to discuss coursework and informally to review the day’s activities.

This learning commons at the Georgia Institute of Technology houses a wide variety of breakout nodes for informal social gatherings.
To accommodate these learning patterns, schools globally are creating collaborative learning spaces. These include scheduled collaborative spaces and unscheduled collaborative spaces. Scheduled collaborative spaces are instructional areas that support more formal learning activities, such as classes. Unscheduled collaborative spaces are informal areas where students can meet out of class to continue their work or discussions.

Before embarking on the design of any collaborative space, schools should answer the following questions, at minimum:

- How do collaborative spaces contribute to the learning process?
- How do scheduled spaces become collaborative spaces?
- What are the characteristics of unscheduled collaborative spaces?
- How is technology integrated into these settings?

Research on Collaborative Spaces

Research indicates that collaborative learning spaces do indeed have a significant and positive effect on student learning. In a 2008 paper, “Scaling Up Educational Reform,” in the Journal of College Science Teaching, Jon Gaffney, Evan Richards, Mary Bridget Kutsuck, Lin Cing, and Robert Beachner concluded that these spaces encourage learners to work cooperatively, problem-solve, and develop scientific learning and communication skills associated with their coursework.

Equally important, the research has contributed to a better understanding of the transactional nature of learning. Just as students are influenced by their learning environments—both social and physical—the learning spaces are, in turn, shaped by the students. These findings reinforce my own research on collaborative learning environments, and advance our understanding of how to design them.

First, collaborative learning spaces must be considered as fully integrated systems, completely aligned with the activities taking place within them. Understanding why the space was created, what types of activities are envisioned, and how these activities are going to take place guide the design process. Once complete, the space can then evolve to accommodate the different needs of its users.

To that end, any final design should combine the following as integrated elements: spatial awareness (the organization of the spaces and the relationships between them), information technology (computers, projectors, flat-screen monitors), building systems (mechanical, electrical, and plumbing), and the learning props (chairs, tables, classroom materials).

Here—and in accompanying slide shows—is a rundown of the various collaborative spaces in use today, their purpose, and some guidance for selecting the right furniture, technology, and props for each.

Scheduled Collaborative Spaces

Formal Spaces. Formal collaborative spaces are essentially classrooms. Unfortunately, the term “evokes a mental image of a professor standing in front of a class lecturing.”
Collaborative learning spaces must be considered as fully integrated systems, completely aligned with the activities taking place within them.

Says Susan Whitmer, research lead in the education group at Herman Miller: "It is difficult to imagine it as a collaborative space." However, thoughtful planning—paired with engaging curricula—can transform classrooms into effective collaborative spaces. Flexibility is key: These formal spaces need to accommodate periods when the entire class meets as a unit and times when it breaks up into smaller groups—as well as to allow individuals to get away to work on their own.

Schools generally employ two approaches to achieve this kind of flexibility. The first creates defined areas to facilitate independent and 1-to-1 work, as well as to accommodate small groupings of six to eight people. Following this approach, a typical area might have fixed features, such as countertops, shelving, soft seating, and tables where small groups can meet. The second approach is an open plan which incorporates fixed round tables, rectangular tables, and D-shaped tables. (For more information, see the slide show “Designing Formal and Semi-Formal Collaborative Spaces" on page 24.)

Regardless of the design approach, these formal spaces should all provide Internet access and be outfitted with sound-enhancement systems, along with various focal points to support group interaction, including projection screens, smart walls (or whiteboards), and/or LCD screens. For power needs, flush-mounted power boards are preferred.
erable to table boxes. Generally, table boxes do not accommodate Macintosh computers, which use large power adapt-
erers. Furthermore, table boxes incorporate data ports that are becoming obsolete as wireless technology takes over.

Semiformal Spaces. In formal collaborative learning spaces, faculty are on hand to keep individuals on task. In semiformal spaces, however, students usually work unsupervised. "These are] settings where students can gather out of class to work in ways required of them by new curricula, which stress the need for students to cooperate and interact in learning-activity and assessment tasks," says Peter Jamieson, strategic adviser of Learning Environment Design at the University of Melbourne in Australia.

These rooms are called semiformal, since students must typically sign up to use them. For the sake of convenience, they tend to be located in resource centers and libraries, or adjacent to instructional spaces and faculty offices. Generally, they support small groups of six to eight individuals, and promote opportunities for presentation, practice, problem-solving, and document development. In these rooms, learners guide the activities and select their own coworkers.

As in the formal spaces, these rooms might have round tables or larger D-shaped tables. Whereas the round tables can seat up to eight people, the D-shaped tables are intended for no more than five. The rooms provide internet access, smart walls for writing, and LCD screens.

Designing Formal and Semiformal Collaborative Spaces

In this open-plan setup at the University of Sydney (Australia), rectangular tables for four to six people provide plenty of flexibility—plus easy interaction with supporting technology. Measuring 80 by 30 inches, each table is on casters for easy mobility. One of the tables acts as a power board, but no A/V cables run to the tables. Stand-alone computers are controlled by a wireless keyboard/trackpad. Two-way video-distribution systems can send—and receive—video to the podiums at the front of the room. While the podiums are not on wheels, they can be relocated. (Photo by Tim Harland)
**Unscheduled Collaborative Spaces**

Unscheduled collaborative spaces are intended to facilitate the approximately 70 percent of learning that takes place in informal settings. There’s no need for sign-ups or appointments for these spaces. Instead, the goal is to promote opportunities for spontaneous sessions where students choose where, how, and with whom to work. To be successful, these unscheduled spaces must provide cues that inform users about their purpose and possibilities.

And since people learn and work in diverse ways, schools should look to provide a variety of these informal settings. In general, such spaces can be divided into three categories (see the slide show “Designing Informal Collaborative Spaces” at right):

- **Breakout Hollows**: Breakout hollows or holes are semi-enclosed spaces that are typically found around public areas. Resource centers, residence halls, the student center, and cafes are the ideal location for these breakout hollows, as are the corridors between instructional spaces and faculty offices. Generally, these small areas are best used for independent work.

- **Breakout Niches**: Less private and more open, breakout niches occur as recesses in walls of hallways,
along windows, and at intersections within resource centers, residence halls, corridors of academic buildings, student centers, and cafes. They are intended primarily for small-group work.

- **Breakout Nodes:** Breakout nodes are found in the most public zones of academic buildings, residence halls, student centers, libraries, and cafes. To be successful, they should feature a variety of different types of space to give learners choices about how and where to work. This is often accomplished by having an architectural disruption—a grand stair, water feature, and/or terraced levels—that encourages students to gather and helps spur interaction, whether in small or large groups or one-on-one.

**2) Types of Learning Activity**
- Is this an instructional space where didactic learning occurs?
- Is this a space where didactic and group learning occurs?
- Is this a space where didactic, group, and independent learning takes place?

**An architectural disruption—a grand stair, water feature, and/or terraced levels—encourages students to gather and helps spur interaction, whether in small or large groups or one-on-one.**

**Planning Considerations**
As schools develop their plans for creating collaborative spaces on campus, it’s helpful to have a road map. Use these three sets of questions as a guide for understanding what kinds of spaces might be needed, where they should be located, how they will be used, and what resources and tools will be needed to support faculty and student users.

- **1) Location**
- Is it a scheduled space (classroom/learning studio or breakout room)?
- Is it an informal space (breakout hollow, niche, or node)?

**2) Types of Learning Activity**
- Is this an instructional space where didactic learning occurs?
- Is this a space where didactic and group learning occurs?
- Is this a space where didactic, group, and independent learning takes place?

**3) Props and Equipment**
- What props (e.g., LCD screens, tablets, smartphones) are most appropriate to support the activities envisioned for the space?
- Should furniture be fixed or not?
- Will there be a single focal point or a variety of focal points?

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PLAYING TOGETHER IN THE SANDBOX

BY MATT SOMMA

The Computer Information Systems department at Bentley University (MA) transformed an old computer lab into a collaborative learning space known as the CIS Learning and Technology Sandbox. Matt Somma, a senior at Bentley and tutor in the Sandbox, explains the rationale behind the transformation.

As society becomes more heavily tech-oriented, Bentley’s CIS department recognized the need for a welcoming venue where students could learn about—and experiment with—technology. The CIS Sandbox fulfills that need. Today, the Sandbox not only tutors students in CIS and IT courses, but also introduces students to the tools they will need in their lives and careers.

An old computer lab was selected to house the new space. Out went the old equipment and in came brighter lights, new cabinets, collaboration workstations for group projects, networking equipment, projectors, a brighter paint job, and—last but not least—a set of comfy chairs.

As for technology, the Sandbox features touchscreen Windows 8 machines, an Xbox Kinect, a Smart Board, three Google TVs, and much more. Although we redid the entire room, it would have been possible to make significant alterations on a smaller budget, too. Simply rearranging the tables and chairs can do wonders to make a room more comfortable for learning.

Creating an innovative tech space is no guarantee of success, however. You also need to change the culture. That’s what professor Mark Frydenberg set out to do when he took control of the CIS Tutoring Lab in 2010. His remit to us tutors was simple: Ask ourselves what students need and how we could fill that need. Our role was no longer just to tutor students and help with their assignments. Instead, we were to help them truly understand what they were doing and to provide learning opportunities outside the classroom.

The third change involved developing an online presence. Today, we are equipped with a social media tool belt including Facebook, Twitter, YouTube, Google+, and Ustream. In addition, we have built a WordPress blog that posts automatically to these social outlets. All content is entirely student created, and we add posts every week about new technologies and what students are learning.

Our final innovation was using the Sandbox to host events, with a view to attracting students even when they didn’t have questions for a class. In the fall semester alone, we staged several career events involving companies ranging from VistaPrint to Microsoft.

So how have we done? Because students have to swipe their ID cards and fill out a form after each tutoring session, we have benchmarked data going back two years. In that period, the Sandbox has seen exponential increases in student attendance and engagement across all classes. CT