Learning Spaces

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CHAPTER 5

Student Practices and Their Impact on Learning Spaces

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Students will spend much of their academic lives in classrooms, laboratories, and libraries—the places where education happens. Such learning spaces impart a feeling of the campus culture to students. But is the culture they sense one of a previous era or one that meshes with their habits? This alignment is important because well-designed learning spaces and enabling technologies encourage students to spend more time on campus, increasing engagement and improving retention.

Understanding the traits and habits of students (and potential students) should shape the discussion of learning spaces. A quick scan of any campus will reveal students hanging out alone or in small groups while reading, taking notes, writing, chatting, or simply enjoying campus life. There may be another layer of activity beyond the obvious, however, enabled by cell phones, iPods, personal digital assistants (PDAs), and laptops. Both student habits and their technologies raise questions. For example, if students carry laptops to class, does this affect how we equip the rooms? Will the generation that has grown up with video games, camera phones, and home theater systems be satisfied with what we can offer in classrooms? What spaces will give students the most educational value?

Student Habits

Today's college students have been described as preferring learning experiences that are digital, connected, experiential, immediate, and social. Constantly connected, they seem to have no fear of technology or interacting with people they have not met face-to-face. Although they communicate a great deal online, they still want direct interaction with others. They appear to prefer learning-by-doing

rather than learning-by-listening and often choose to study in groups. Much to the consternation of adults acculturated to lectures, they become impatient in situations where they don't feel engaged.

While many student attributes may be important to educators, five characteristics seem particularly applicable for learning spaces:

- Digital
- Mobile
- Independent
- Social
- Participatory

Digital

Many students under 20 years of age are adept with technology, according to faculty and staff standards. They have adopted practices that are quickly becoming the norm, such as instant messaging, text messaging, Googling, and social networking. Students' comfort with the Internet means it isn't "technology" to them—it may be a way of life.

Students are used to entertainment environments with rich images and high-fidelity sound. Most students have played video games since childhood; almost all have been exposed to them. In addition to sophisticated story lines and opportunities for collaborative play, games employ stunning visual and sound effects along with complicated story lines. Students may have technically advanced home entertainment systems featuring large, high-resolution displays and elaborate sound systems. Video-game consoles can generate complex graphical data rendered in close to real time. Home theater systems rival movie complexes.

While students have access to more networked technology than their predecessors, many are not technophiles—or even good with technology. Comfort with technology does not guarantee proficiency. Students recognize that technology often provides the fastest and best way to get something done, so they have developed social structures to solicit answers from friends and acquaintances. As a result of these social networks, new technologies and practices are adopted and discarded quickly.

Mobile

Aided by devices like laptops and iPods, students bring their preferred environments to campus with them. Most students carry at least one connected device,

and most have MP3 players on which they will have spent significant amounts of money and effort to ensure that they have the perfect song collection at all times. In addition, student use of cell phones is almost ubiquitous. Many have had cell phones for more than half their lives. Although functional and effective, cell phones may have joined cars as status symbols—owners customize models with personalized ringtones and colorful add-ons.

Students take advantage of the ability to communicate with one another, connect to the Internet, and access information at all times through laptops and cell phones. Short message service (SMS) and instant messaging let them maintain constant contact with one another. Students share information about their current locations, activities, and companions on an almost constant basis, not just with text but by sharing pictures, movies, and audio.

Handheld devices have impressive displays. All but the most basic cell-phone models include full-color screens capable of displaying pictures and video. Cell-phone carriers are exploring agreements with media providers and other partners to use the capabilities of their devices for playing podcasts and MP3s, for example. Phones able to create and share podcasts were recently announced, and GPS and mapping software are being integrated into handheld devices.

Independent

The Internet has given rise to a new set of competencies. Individuals surf the Internet to uncover facts, chase down links of interest, and then aggregate and synthesize information. This self-reliance reveals that many of today's students are self-directed, internally motivated, and inquisitive. They choose when to pay attention—and what to attend to.

Students will spend hundreds of hours in class. While they might not have much choice where they spend their class time, they do control how they behave in these spaces. Given their facility with cell phones, iPods, laptops, and other mobile devices, new in-class practices are evolving.

Once freed from the classroom, students gravitate to the spaces most appealing to them. Comfortable and customizable spaces quickly become candidates for frequent use between classes. The informal learning that takes place outside classes occurs in libraries, information commons, coffee shops, and any other locations where students can gather.

Social

Using video cameras or similar devices and aided by MySpace-type environments, students can capture and share experiences with friends and strangers alike. This social side of students manifests when they share knowledge of new technologies; most learn new things when their friends show them how.

Students are quite comfortable with group work and interactions. One of the traits of the Net Generation is the ease with which they can form and re-form working groups.

Many students will have spent time in highly social, engaging online game environments. Unlike the physical space students typically inhabit, these spaces can be configured to match students' preferences.

An interesting emerging practice that fits with students' social inclinations is the Nokia Lifeblog, an Internet community that allows owners of Nokia mobile phones to document and share every aspect of their lives in real time. The phones allow users to capture photographs, sounds, and other artifacts, then instantly share them with family, friends, and the general public. Content could be breaking news or the discovery of the latest food hotspot. And because Lifeblog is an Internet community, a lurker can quickly become a colleague by contributing comments and sharing experiences.

While the Nokia Lifeblog community represents a small subgroup of Nokia owners, the practices they employ are not unique. The Internet enables social software, open sharing, and serendipitous discovery of small groups of people with common interests, often in very specific and esoteric subjects.

Participatory

"Open source" is not just a way of developing software; it is a mindset about participation. Bloggers embody the do-it-yourself (DIY) spirit. Lack of easy-to-use tools required bloggers to find their own solutions; many of the early bloggers got their start using blogging software they created. The DIY attitude extends to their creation and consumption of content on the Internet. Reputation, as well as recommendations and referrals, are of paramount importance. Curiosity, debate, and consensus are all valued traits in the blogging world. Many of today's students possess these traits.

Many technologies used by students have a low barrier to participation and a fun contribution process. For example, Digg.com makes it easy to share opinions and

rank the top stories of the week. Flickr makes it easy to share photos with friends, family, and the rest of the world. When users explore the Flickr Web site, they are encouraged to upload their favorite photographs. But Flickr goes beyond just photo sharing; options include geotagging photos. A photo can include tags that pinpoint its exact latitude and longitude. Integration with an application such as Google Maps allows users to populate locations with their own tags and documentation; tagging permits the sharing of a personal history associated with any space.

Classrooms and Formal Spaces

Classes are the most visible components of campus life. Lectures typically involve a single "expert" delivering content to students through a combination of diagrams, text, and narration. Classrooms have relatively straightforward requirements: line of sight, good acoustics, and a focal point at the front of the room. Even in formal learning spaces, however, instructors can take advantage of emerging student practices in a variety of ways.

Students are constantly connected, yet classrooms may seem disconnected. Classrooms need not be isolated from the rest of the world—ubiquitous access brings additional capabilities. A class can "travel" to any location in the world through the Internet, have experts "visit" them, or browse available resources. Remote instrumentation and laboratories make it possible for students and faculty to run experiments or control a device without leaving the room.[1] Used effectively and thoughtfully, technology in the hands of the instructors can bring new dimensions to the class.

Many instructors find that interspersing interactivity, discussion, and group work in lecture engages learners. Physical constraints, however, such as the ability of students to turn around in their seats, can limit the success of these techniques. Some lecturers assign students to groups, producing seating maps of their lectures to help facilitate group forming and save time. In other cases, the room is designed for student collaboration. Seats are arranged in paired rows with specially design chairs that allow students to face each other for collaboration (For example, see chapter 22 on LeBaron Hall, a large lecture hall at Iowa State University). Other spaces are outfitted with movable tables, chairs, and whiteboards so that seating can be reconfigured to suit the activity.

Technology can greatly enhance interactivity in the classroom. For example, student response systems solicit and track student progress throughout a class by enabling anonymous polling. Many expect to see cell phones used as student

response systems in the next few years. Another option is to allow students to "take control" of the computer and present during class. Facilities that have wireless keyboards and mice make it easy for students to present from where they sit. Space and pedagogical models, such as SCALE-UP (see chapter 29), are designed around interactivity. The round tables, student teams, and the ability to see others create a highly interactive, participatory environment.

Mobile technologies can also be used to engage students in learning. Using laptops or Tablet PCs combined with a wireless network, students can search for additional information on the Web, engage in collaborative editing, or use learning objects to illustrate specific points. Lectures or discussions can be captured and the podcasts replayed later.

Informal Spaces

Students spend a large proportion of their time outside class. Students and faculty value the time spent with peers discussing academic work or other topics. Spaces that catalyze social interaction, serendipitous meetings, and impromptu conversations contribute to personal and professional growth. Many different types of communication devices, including laptops, enhanced cell phones, and PDAs, when equipped with ubiquitous wireless access, allow almost any space to become a gathering space that students can use for studying, collaborating, and socializing. These informal spaces, often combining food services and wireless access, are ideal for casual activities including searching the Internet, catching up on e-mail, or chatting with friends. Students are no longer confined to computer terminals; indoor and outdoor spaces can become study areas or a social space as long as the Internet and power are available.

MIT's Steam Café, for example, encourages serendipitous connections among students and faculty through the space design, the use of technology, and food services (see chapter 27). The University of Dayton has integrated informal learning spaces with classrooms and a residence hall to enable frequent contact and interaction among students and faculty (see chapter 3).

The emergence of learning commons provides another example of how out-of-class time is being enriched with learning opportunities (see chapter 7). The Information Commons at Northwestern University (see chapter 30), the USITE/Crerar Computing Center and Cybercafé at the University of Chicago (see chapter 40), and Emory's Cox Hall Computing Center (see chapter 8) exemplify the integration of space and services based on an understanding of how students work and live.

Creating spaces for spontaneous meetings is particularly important. "Think stops" are places for individuals to stop, relax, and meet others. Often marked by a chalkboard or whiteboard, these locations encourage impromptu meetings and conversations. The ES Corridor Project at Indiana University-Purdue University Indianapolis (IUPUI) illustrates how valuable these spaces can be, even if they were created with limited funds (see chapter 21). And, given the ability for Internet-savvy individuals to self-organize, think stops in the future may no longer need distinctive physical attributes—they may be virtual instead.

With applications like Flickr and Google Maps, students can tag their campuses with personal histories, giving them novel ways to make campus spaces—new or old—their own. A recent posting on a University of British Columbia (UBC) student portal prompted a discussion about the best places on campus to sleep. In the future, will technology-enabled geographic locators aid discussions like these?

What Colleges Can Do

Based on student habits, colleges and universities should consider several learning space principles that mix space, technology, and services.

Participation

Today's students often learn better by doing rather than by listening. As a result, classroom, laboratory, and studio designs that provide students with ample opportunities to participate will become more common. Whether the form of participation is discussion or construction, designs should enable interaction, transparency (seeing others engaged in work), and group work. Participation may be physical (such as constructing a model) or virtual (videoconferencing). When considering the technologies to support, remember that students no longer just consume information, they construct it—in multiple media formats.

Connections

Learning is a social process. Often the most memorable college experiences involve connections with others, whether students or faculty. All indications point to the importance of learning spaces that facilitate connections. Those connections are not just verbal or spatial—they are visual, enabling people to see others and feel as though they are part of something bigger (see chapter 10), such as observing a class at work in a laboratory. In other cases visual connections enable one-on-one conversations, such as a student seeing a faculty member in the café and stopping

to chat. Connections can be virtual as well, where students work with others who are not physically colocated (through videoconferencing, for example) or who are separated by time (through asynchronous communication).

Connections may be from the campus to the outside world (a view of a natural landscape, for instance) or by allowing the outside world to view the campus.

Connections can also be made with information. Displays can highlight departmental activities or provide a glimpse of world news, stock prices, or environmental conditions. For example, Hamilton College's Science Center (see chapter 20) highlights many green features of the center. External and internal environmental conditions can be monitored along with operating the geothermal and heat-recovery systems.

Proximity

Because of the importance of student-faculty interaction, faculty offices are being located close to student spaces. Multiple departments are housed together to encourage interdisciplinary collaboration. Some campuses are establishing subcampus environments that bring specific departments together. Interaction, collaboration, and engagement can be stimulated by placing people in proximity to each other. Placing student study areas in close proximity to classrooms can be helpful as well.

Integration

Students blend the physical and virtual worlds, moving seamlessly between living and learning environments. When they express themselves, they are increasingly likely to mix audio or images with text. When they have a problem to solve or assignment to complete, the steps are integrated rather than sequential. Colleges and universities can model spaces after students' integrative behavior.

Whether on residential or commuter campuses, students mix classes, study, group work, eating, and sleeping. Increasingly institutions are designing spaces that allow students to work, socialize, and sometimes sleep. Information commons and computing labs such as Emory's Cox Hall Computing Center provide multiuse spaces. Others repurpose between-building space for student use, such as Michigan Technical University's Center for Integrated Learning and Information Technology (see chapter 25).

As seen in information commons, multipurpose spaces integrate services. Students need not move from location to location to complete research or assign-

ments; tools and support personnel are brought together to serve their needs.

Integration also occurs between the physical and virtual worlds. Online tools for team collaboration can be integrated with physical space design, such as Stanford's GroupSpaces (see chapter 35). Within the virtual environment, students integrate multiple media forms. No longer confined to text, students integrate images, video, and audio into assignments; institutions must expand the available technologies to accommodate learners' needs and habits.

Flexibility

Students, like faculty, prefer to control their environment. The ability to rearrange seats or adjust the lighting makes it possible for the same space to be used in many ways, by different groups, throughout the day. A computer lab or classroom may become the site of a jazz concert or a game competition at night. This flexibility also allows customization, enhancing not only space utilization but also convenience.

Flexibility also fosters different teaching and learning styles. Not all faculty can—or should—use the same instructional style. Pedagogies should be tailored to the subject, the learners, and the intended outcomes. Student needs and learning preferences vary as well. Spaces that are flexible, accommodating different approaches and uses, improve the odds for effective learning. Many institutions are finding that students will assume responsibility for self-scheduling and self-policing, so flexibility is not necessarily synonymous with irresponsibility.

Ubiquitous Access

For students whose world is digital, connected, immediate, social, and participatory, access to a wireless network is becoming mandatory. The students' world is not just the physical one in which they find themselves; it is also the virtual one in which they chat with friends, meet people, share photographs, and explore new ideas. Neither learning nor socializing is one-dimensional; the physical complements the virtual, and vice versa. Since learning can occur any place and at any time, there are few—if any—locations where wireless is not valuable.

Because students consume information in multiple formats—text, audio, photographs, and video—and interact with information by modifying it or sharing it, this activity places additional demands on the network. During peak periods, student use may saturate the wireless network, making it important to have wired connections available as well as wireless.

Personal Devices

Most students own a variety of technologies—laptops, MP3 players, cell phones, and more. As technology becomes more ubiquitous and affordable, institutions will find opportunities to deliver information and services in multiple formats and to multiple devices. Convenience is a priority for students, so ensuring that any space can be a learning space—bus, residence hall, sidewalk, or café—by delivering information to personal, handheld devices is important. In the future, some students may choose to carry a USB device (or thumb drive) with their files and applications rather than carrying a laptop (see chapter 9). Student mobility means that students, not just the institution, define the learning space.

Regardless of the technology students use in learning spaces, they will need power—all laptops and MP3 players have a limited battery life. Space planners must take this requirement into account.

Support

Although students have little fear of technology, they are not necessarily proficient with technology, information retrieval, or cognitive skills—what many call *information fluency*. It is not just technology or information resource assistance students need; sometimes that assistance involves writing, student services, and so on. Locating support desks and help systems where students (and faculty) are, rather than just where the unit's home base is found, encourages use. Some IT units locate technical support staff in classroom buildings. Learning commons create one-stop centers, incorporating services from the library, IT, and the writing center. Although they may look different or have a new name, help desks are probably here to stay.

Involve Students

Student use of spaces and technology can easily be misunderstood when viewed from a nonstudent perspective. For example, faculty or administrators might consider lounge seating in a library to be distracting, while students find it the best way to study. Students will likely spend more time in campus learning spaces than anyone else. Learners have a legitimate perspective on what works—and what doesn't. Finding meaningful ways to involve students in planning and evaluating space design is an effective way to ensure that space catalyzes learning.

Conclusion

Students are changing, technologies are changing, and learning spaces are changing. Students will use the spaces that best suit their needs. By examining students' habits and use patterns and then creating spaces that meet their needs, we have an opportunity to make our institutions more student-centered and appealing. At UBC, the motto is *Tuum est*, which in Latin means "It's yours." By creating the spaces that our students will use, we can give students the opportunity to make the university their own.

Endnote

1. EDUCAUSE Learning Initiative, "7 Things You Should Know About Remote Instrumentation" (Boulder, Colo.: EDUCAUSE, 2006), <http://www.educause.edu/ir/library/pdf/ELI7013.pdf>.

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