Learning Spaces: More than Meets the Eye

With the advent of technology on campus comes a shift from classroom to learning space as technology is incorporated in teaching and learning

By **Malcolm B. Brown** and **Joan K. Lippincott**

In the past, if you spoke of something like "learning spaces" in the context of higher education, attention focused on classrooms: physical spaces designed to support face-to-face teaching and learning. Most higher education institutions have a great deal of history and investment in their classrooms. Indeed, many of our classrooms are dozens—and some hundreds—of years old and may have been renovated many times.

While classrooms can still be regarded as our core learning spaces, it is obvious that a host of new factors and opportunities has dramatically changed this landscape. Indeed, so much is changing that we are forced to use a broader term like learning spaces to capture this wider range of venues for teaching and learning. Focusing just on classrooms is no longer an option.

One compelling reason for this shift is that the concept of the classroom is both expanding and evolving. It is expanding as traditional face-to-face classrooms receive technology installations and so acquire new functionality. As the functionality expands, new learning activities become possible. But the concept of the classroom is evolving as well. New conceptions of the classroom are being driven by the emergence of new methods of teaching and learning, made possible by the rapid evolution and adoption of information technology. Wireless networking, for example, makes real-time or synchronous interaction among students and between students and faculty a very

real possibility. Mobile computing, such as the use of wireless laptops and handhelds, makes possible a variety of collaborative and synchronous learning activities. This is why the term classroom, at least in its traditional sense, can no longer encompass the teaching and learning options today.

More learning is taking place outside of class time than ever before. With an increased emphasis on collaboration and group projects, students are learning in small groups outside of the classroom as they accomplish work related to their courses. Often they need spaces equipped with access to network connections as well as spaces that facilitate group interaction. They may seek these spaces in dorms, in libraries, in computing centers, and in campus coffee bars.

Another compelling reason for the shift is that, because of information technology, we can think of virtual as well as real spaces. Unlike real spaces, virtual spaces come and go. They can be spontaneous as well as deliberate. They can be synchronous or asynchronous. Participants and their relationships in the virtual learning space can shift rapidly. Participants can also multitask, "inhabiting" more than one virtual space at a time. As our networking technology matures and costs for devices such as laptops and handhelds decline, these virtual spaces play an increasingly larger role in all aspects of higher education.

In light of all this, it is clear that, in our
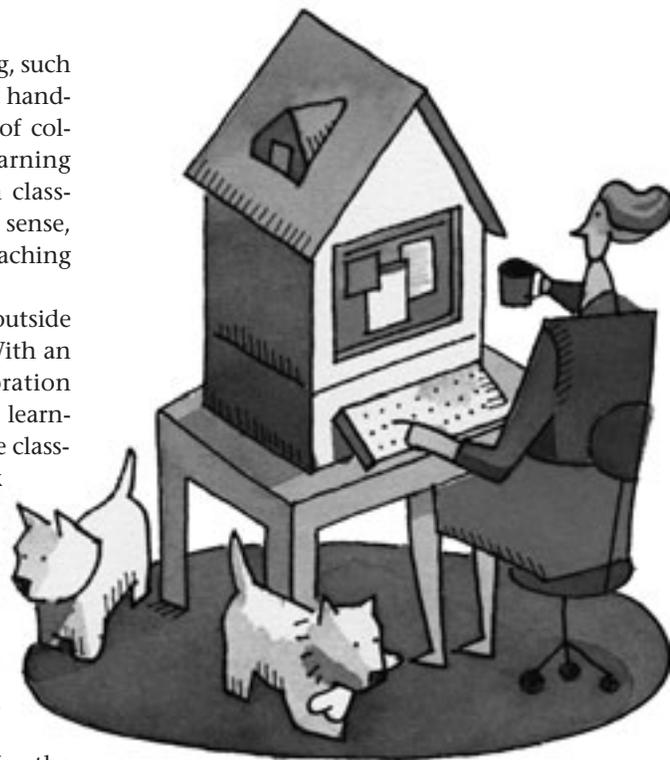
planning to support teaching and learning on our campuses, we must adopt a broader frame of reference than just our traditional, physical classrooms. We must broaden our scope in at least two respects. First, as we have sketched, we must think in terms of a variety of both real and virtual learning spaces. Once we widen our purview to include virtual spaces, then the second shift in thinking becomes clear: we must think about all the support needed to make these learning spaces successful. This includes faculty training, development of digital curriculum materials, help desk support, hardware and software maintenance,

and good network or wireless connectivity, just to name a few.

Real and Virtual Learning Spaces

The grand challenge for colleges and universities is to create a seamless, technology-enabled learning environment for faculty and students, one that addresses the use of all our learning spaces. Often campuses attack this problem with a single strategy, such as developing a plan to equip one or more technology classrooms per building or department. While this is a useful step, it is just one component in developing an over-arching strategy for campus learning spaces. In the current environment, a wide range of real and virtual spaces can become a rich campus resource for support of teaching and learning.

Most campuses begin their focus on technology-enabled classrooms by equipping large lecture rooms with equipment for the instructor or for both instructor and students. Early implementations show that the ability to easily reconfigure the seating arrangement of large classrooms for various purposes and the ability to shift the seating arrangement from lecture mode to collaborative group work during a class session are desired attributes of new classroom facilities. Also, most campuses have a need for technology-enabled classrooms for small classes as well as large lecture classes. All of these classrooms require up-to-date equipment and good network connectivity. Computer labs in computing centers, libraries, and departments provide other venues for students who are learning their subject matter with the assistance of technology or producing technology-enabled products for their assignments.

Students continue their work outside of class in spaces that promote social learning. Many libraries are developing group study rooms that have network connectivity, and some lend out laptops at their circulation or reserve desks. Some libraries have "collaboratories" constructed to promote peer learning, where both formal and informal teaching and learning take place. Informa-

tion commons in libraries provide a welcoming environment in which students and faculty can explore information resources and find assistance with their work. Other social spaces include coffee bars—in libraries and in other places on campus—and dormitories. Campuses that wish to genuinely address the needs of students for technology in support of teaching and learning need to take into account these types of social spaces as well as formal classrooms.

Spaces that support the development of materials for teaching and learning are part of the equation for promoting faculty and student use of technology in the curriculum. Teaching, learning, and technology centers provide a venue for training faculty to incorporate technology into their courses and serve as labs for developing materials. Multimedia studios and digital production centers, some housed in campus libraries and others in audiovisual centers, are also part of the panoply of learning spaces that produce a robust campus technology environment. On some campuses, these spaces are being developed as collaborative initiatives of the library, computing center, instructional technology center, and media center.

Another dimension of new learning spaces encompasses the support structures necessary for virtual learning spaces. These include ubiquitous connectivity on campus and, importantly, off campus; learning management systems; and access to innovative software such as virtual environments.

Supporting Learning Spaces

In the past, when they were responsible for physical classrooms, planners needed to be concerned about maintaining the physical aspects of the rooms: seating, carpeting, lighting, and so forth. With the advent of the expanded, technology-enabled classroom, a new layer of support became necessary, requiring staff with a wide range of technical and support skills. Classroom technology support staff install and maintain digital and analog equipment, software, and networks. In addition, the technology classroom now requires training for faculty and other

users, as well as technicians ready to come to the rescue should the technology balk.

Our technology classrooms also rely on other aspects of the campus infrastructure, such as the campus network. Support staff must have the interpersonal skills to encourage faculty and students appropriately to explore the full range of a classroom's functionality. All this makes it clear that adding technology to classrooms has greatly widened the scope of what it means to support classrooms on campus.

The emergence of new kinds of learning spaces makes it necessary to enlarge our concept of support of learning spaces by at least one more layer: support for faculty and students outside the classroom. As ambitions for teaching and learning expand, so too do the complexities of the projects that both faculty and students take on. Faculty and students must be able to "enter" these learning spaces with the gear and skills needed to use them successfully.

With this expanded concept of learning space support, there are many roles for both librarians and computarians. In addition to answering questions about equipment problems or access to information resources, we may need to provide access to specialized equipment for the preparation of digital content and the conversion of that content from analog formats. We may need to assist faculty in understanding the intellectual property issues involved in the preparation of digital curriculum materials.

The ability to access help, whether through a computer center help desk or online reference services from the library, while learning in virtual spaces, is a key support requirement. We might need to provide rehearsal spaces and assistance so that faculty and students are trained in the use of real as well as virtual learning spaces, such as MOOs (multi-user domain object–oriented environments). We may need to assist faculty and students in accessing the virtual spaces, like MOOs and chat rooms. With the advent of wireless networking, virtual learning spaces can happen anywhere and at any time. We might need to provide anytime, anywhere support

to individual users encountering problems in virtual spaces.

Developing an Integrated Strategy

As campuses make a commitment to incorporating technology into teaching and learning, we suggest a shift in the way we look at these developments. Campuses should develop an interrelated strategy that takes into account a range of types of learning spaces, including virtual spaces, and a range of support services.

The learning spaces and the support services are mutually dependent, and that is a key factor to include in the strategic planning for a teaching and learning infrastructure. It means little to have "thick" technology in our classrooms if our faculty and students do not have the skills and the gear to utilize those classrooms. Computing centers, teaching and learning centers, and libraries may want to develop guidelines, in conjunction with faculty, on what hardware and software will be supported for teaching and learning. Developing an integrated approach to support implies that staff will have the capabilities to assist with specified hardware and software, will be able to train or work with faculty and students in that environment, and will provide help desk and troubleshooting support for specified systems. Our constituents must be able to prepare materials to present in those classrooms and have the capability to use sophisticated software and hardware for their presentations. They require access to equipment and networks in good working order, and ready access to staff if problems arise.

If you unpack the modern concept of a learning space, you discover a set of layers or components, all of which must be on hand if the use of the learning spaces is to succeed. *e*

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Resources

The Coalition for Networked Information and Dartmouth College have developed a Web site, Collaborative Facilities, which highlights new or renovated technology-oriented spaces that have involvement by more than one unit on campus. Facilities such as information commons, multimedia studios, and classrooms are included. It is available at <www.dartmouth.edu/ ~collab>.

Issue 222 of the *ARL Newsletter* (Association of Research Libraries) includes three articles on collaborative facilities by Betsy Wilson, University of Washington; Barbara Dewey, University of Tennessee, Knoxville; and Joan Lippincott, Coalition for Networked Information. The articles give advice on the planning process for collaborative facilities such as media labs and collaboratories for teaching and learning. It is available at <http://www.arl.org/ newsltr/222/index.html>.

The EDUCAUSE 2000 Current Issues Roundtable summary on "Electronic Classrooms and Buildings of the Future," moderated by Elia Schoomer, Lehigh University, includes a very useful list of issues, trends, and questions to be addressed concerning learning spaces on campus. It is available in the EDUCAUSE Information Resources Library: <http://www.educause.edu/ir/ library/pdf/EDU0074.pdf>.

The Smarter College Classrooms Home Page leads to information compiled by a consultant. Good detail on many practical matters related to the configuration and equipping of electronic classrooms is included. It is available at <http://classrooms.com/index .html>.

Transcripts from two CREN TechTalks

provide useful discussions of learning spaces. One, featuring Malcolm Brown of Dartmouth College, reports on a survey of key issues and includes useful links to campus sites with good information on their electronic classroom programs. It is available at <http:// www.cren.net/know/techtalk/events/ smartc.html>. The other CREN transcript features Bruce Taggart of Lehigh University and Darryl Davis of East Carolina University discussing issues such as faculty uptake of technology in teaching and equipment issues for electronic classrooms. It is available at <http://www.cren.net/know/techtalk/ trans/smartc2_1.html>. Audio versions of these programs are also available on the CREN Web site.

With respect to MOOs (multi-user domain object-oriented environments), a good example of an implementation with many useful features is Lingua MOO <http://lingua.utdallas.edu/>.

A general overview is available at <http:// www.well.ac.uk/wellclas/moo/moo.htm>. Another example of the use of the MOO in the curriculum is the SilverSea MOO at the University of Texas at Austin, <http://wwwnt.cwrl.utexas .edu/web/tech.cfm?page=moo>.