

Inversions

By Malcolm Brown

Inversions are fascinating phenomena. We all know what inversions are: reversals of the normal or expected order. They occur across a wide variety of contexts. We speak of them in music, linguistics, meteorology, sociology, journalism, and even therapy. In meteorology, for example, an inversion consists of a layer of warmer air that moves on top of a layer of colder air. This is a reversal of the norm, since air is normally warmest near the earth's surface and gets colder with increased distance from the ground. Such a thermal inversion can trigger events such as fog, smog, freezing rain, thunderstorms, and other meteorological events.

Malcolm Brown is Director of Academic Computing at Dartmouth College.

What do inversions have to do with learning spaces? I suggest that they are a useful metaphor for the process that is unfolding in higher education with respect to education. On the basis of constructivist learning theory, networked information technology, and a new kind of student and faculty, the traditional educational layers (with the teacher as the maker and presenter of information and with the student as the recipient and audience of information) are inverting. In the new curriculum, students can be presenters, knowledge creators, and active planners of their own learning. Nowhere is this inversion more evident or visible than in our learning spaces: here, captured in the built environment and in the technology, we are seeing an inversion of the traditional order.

The articles in this issue of *EDUCAUSE Review* make this inversion very apparent. The authors have presented a broad range of valuable insights, observations, and recommendations. Here I'd like to tie these articles together by identifying their common ideas and themes.

Design Your Learning Spaces in Terms of Verbs, Not Nouns

The authors in this issue of *EDUCAUSE Review* make it clear that learning spaces are not about stuff, and they're not about technology gadgets. They're about what faculty and students can *do* in those spaces. This point is articulated clearly in the article by Phillip Long and Richard Holeton, but it is also a key point in Joan K. Lippincott's analysis as well. Lippincott stresses that learning space design is not about new, gleaming surfaces or the latest cool technology. The latest technology is cool for only a brief time, and then it quickly becomes ordinary, superseded by the next release. Gleaming surfaces lose their gloss in a very short time. Instead, we need to tie learning space design and planning to specific curricular goals and to major initiatives such as curriculum redesign and similar institutional initiatives.

At the core of Long and Holeton's suggestion is that we need to cease thinking of our learning spaces as containers of things and instead, urged on by con-

structivist learning theory, design these spaces from the inside out by focusing on what the users will be able to do. Long and Holeton offer sets of design principles, from four different authors, which share four overarching themes:

- Learning spaces need to be flexible, supporting a variety of learning and instructional modes.
- Learning spaces need to be designed to take human factors into account.
- Learning spaces need to strike a balance between being technically robust and being simple to operate.
- Learning spaces need to provide faculty and students with full and open access.

The new idea in Long and Holeton's article is that we should focus on verbs that describe what people should be able to do in learning spaces, active verbs such as *connect, design, discuss, construct, and present*. This idea echoes planning processes that have emerged from the EDUCAUSE Learning Initiative (ELI) focus sessions

on learning spaces: participants were urged to approach space design in terms of what people should be able to do, rather than in terms of the gear and furnishings of the space.

It is important to note that all of the authors in this issue of *EDUCAUSE Review* urge us to think in terms of *sets* of verbs, rather than in terms of just one or two verbs. We find this idea in the article by Shirley Dugdale, who stresses “the importance of supporting multiple ways of learning, including social learning and virtual discourse.” She also makes this important point: “In the future, space types are more likely to be designed around patterns of human interaction than around the specific needs of particular departments, disciplines, or technologies.” The authors are urging us not only to think about verbs (or design principles that state what faculty and students can do) but also to construct our spaces with as many verbs “built in” as possible.

Learning Spaces Constitute a Network, Not a Container Ship

A container ship is a collection of containers held together in a common location. The containers may individually hold items of great value, but the containers themselves do not overlap and certainly can in no way be thought of as a network. Yet the container ship is all too often the model that is used in the provisioning of learning spaces, particularly with regard to the built environment. Traditionally, the planning, provisioning, and maintaining of classrooms and learning spaces has been separated into containers: “registrar classrooms,” departmental classrooms, the library information commons, the IT organization’s computer labs, and so forth. Furthermore, the work of the groups overseeing the planning and support of these rooms has also resembled a container ship: they work hard but often separately, with each group having its own piece of the puzzle but all too often with no sense of an overarching connectedness or a big picture.

The authors in this issue of *EDUCAUSE Review* suggest that we should think of our learning spaces more as a network. Dugdale articulates this perhaps most succinctly: we are urged to envision



our learning spaces as a set of “overlapping networks of compelling places and hubs.” It would seem that we will be most successful if we think of our learning spaces as one network, or environment, or ecology. Some advantages of coordinating the planning of all campus learning spaces might include the following:

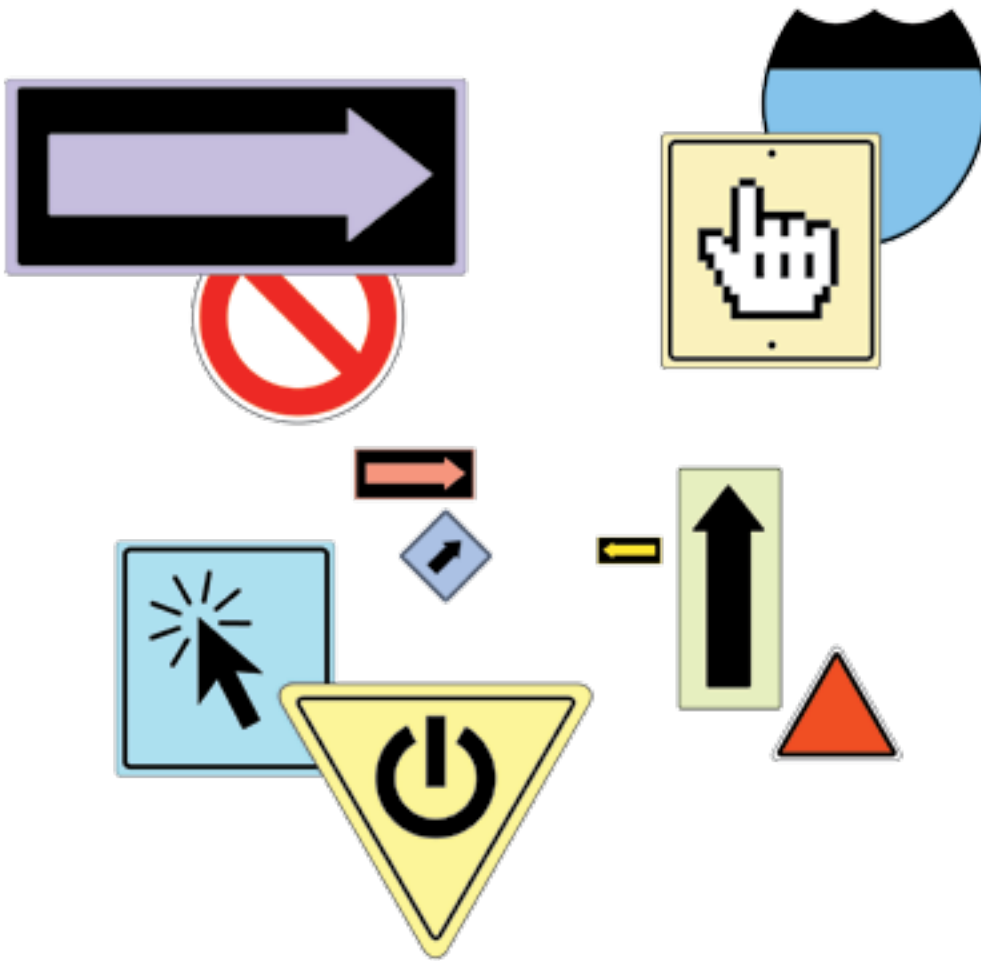
- Technology standards across all spaces to increase ease of operation
- A way to achieve the right blend of formal, informal, and virtual spaces
- Coordination to ensure that the virtual environments play well in the built environments
- Flexibility in assigning courses to rooms
- A way to enable promising innovations to propagate across campus, and eventually to become standards
- A way to coordinate on assessment efforts, so that learning space assessment is for the institution, not just for a subset of campus spaces

Further, by thinking of all of an institution’s learning spaces as a single network

(or overlapping networks), we can link the overall learning space environment to institutional priorities.

We can also think of our learning spaces as a network in terms of their planning, construction, and maintenance. Lippincott warns of a gap that can arise between planners and faculty if there is not sufficient coordination between these two groups. We can extend this warning to include students as well. Recent efforts, such as the one documented at the University of Rochester, show how profitable it can be to include students in the design process for learning spaces.¹ Lippincott also reminds us that learning spaces, particularly innovative ones, are most often the product of a *community* of planners and stakeholders. As Dugdale puts it: “There are great opportunities today for partnerships among libraries, academic computing groups, and student centers to develop spaces into new kinds of informal learning environments.”

This leads us to the concept that our learning spaces are best conceived of as interconnected networks of learning



environments, supported by a community of administrative staff, computerians, librarians, faculty, and students. Each member of the community has a contribution to make to the fostering of successful learning spaces, but these efforts need to be meshed and coordinated in order to create as seamless an environment as possible for the benefit of users.

If You Build It, They Won't Come Just Because You Built It

One apparent paradox that emerges from the articles in this issue of *EDUCAUSE Review* is the impact of space on the practices of the people who use it. Long and Holeyton quote from a JISC publication: "Spaces are themselves agents for change." This would seem to make sense intuitively: rooms with chairs attached to the floor in rows dictate one kind of usage, whereas rooms with furniture on wheels open up whole new categories of usage. But as Sawyer Hunley and Molly Schaller explain: "Spaces can limit the

range of pedagogical practices that faculty feel comfortable using, but they do not expand the range.” This appears to contradict the idea that an innovative space can and should expand the range of pedagogical practice.

This apparent contradiction dissolves, however, on closer inspection. An important implication of Hunley and Schaller’s research is that the built environment (whether physically or virtually built) *alone* does not ensure movement away from the traditional (or industrial) education practice. Note the authors’ insistence that such environments do not, by themselves, generate innovative practice. We can conclude that if you build it (an innovative learning space), they might still not come (use it in innovative ways). This is true of both faculty and students.

To help understand this point, we should employ the architectural term “desire paths.” Such paths are formed by the shortcuts that people take through a

built environment in order to get where they want to be in the least amount of time and with the least amount of effort.³ People create desire paths not just through the built environment; they also create desire paths in their “practices” environment. Faculty and students will do the same in learning spaces: make a beeline back to the old, familiar practices unless they are assisted in undertaking and sustaining the transition from the old practices to the new ones. Hunley and Schaller write: “Faculty who were not comfortable with a range of pedagogical approaches tended to alter the most innovative spaces so that the rooms would have a ‘lecture room’ feel.” The important conclusion is that a multidimensional effort will be required to transition the institutional culture to learner-centered pedagogy, which will match and coordinate learning space designs with faculty and student development and support. It’s not easy to kick old habits.

Supporting the evolution of user

practice needs to become a vital component of learning space design, a point that Lippincott makes repeatedly. This joining of evolving user practice and more traditional design comes across as counterintuitive only if we remain within the old-school mentality of learning spaces as *containers* filled with *things*. The new school of thought, which these articles suggest to us, focuses on layers of activities and verbs. But again, the “verbs” of a space remain mere potential unless they are realized by evolving, innovative user practice. For this, communities of practice are essential—reinforcing the idea that the development of learning spaces and environments needs to be a coordinated institutional effort involving a host of campus players.

Developing a Strong Sense of Place

One additional theme that emerges clearly from these articles is the importance of human factors in planning learning spaces. Users must feel that the

space is comfortable and that it supports their success. These are elements that cannot always be mapped directly to a learning function but that nevertheless play an important role in encouraging use. This theme is evident in Long and Holeyton's article. The traditional, transmission-style instruction model generated classrooms informed by a one-size-fits-all philosophy. This approach echoed the industrial practices of the late nineteenth and the twentieth centuries, where profits were maximized through assembly lines and other industrial techniques. If we think instead in terms of the constructivist learning model, we know how limiting this industrial approach can be.

The research of Hunley and Schaller explicitly references the dimension of human factors. They tell us that "the emotional reaction related to the environment encourages or discourages engagement for both faculty and students" and that successful learning spaces "promote a sense of connection with the environment, stimulate positive emotional responses, interest, and enjoyment, and encourage feelings of autonomy and competence during challenging tasks." They point out that learning in spaces is discouraged by factors such as poor air circulation, uncomfortable temperatures, distractions, and noninteractive furnishings. Conversely, the use of space is encouraged by factors such as food and drink, visual appeal, flexible lighting, and access to natural light. Hunley and Schaller sum up this vital point: "There appears to be a reciprocal interaction between a learning space and its users." There is no conflict in designing technology-rich spaces that address first and foremost the needs of the users.

All of these articles emphasize that emotional attachment is vital to the development of a positive sense of place. Learning spaces that achieve this emotional attachment will foster enthusiasm for the enterprise of learning.

Inverting the Inversion

In a short article that appeared in *EQ* in 2003, Joan Lippincott and I called attention to the need to shift design thinking from the more narrow focus

of classrooms to the wider concept of learning spaces. We suggested that a "grand challenge" for institutions of higher education was to "create a seamless, technology-enabled learning environment for faculty and students, one that addresses the use of all our learning spaces."⁴ Indeed, "creating learning environments that promote active learning, critical thinking, collaborative learning, and knowledge creation" is #1 in the EDUCAUSE Top Teaching and Learning Challenges recently charted by ELI (<http://www.educause.edu/eli/Challenges/127397>).

The articles in this issue of *EDUCAUSE Review* not only renew this challenge but also offer valuable and concrete suggestions for making progress toward meeting the challenge. We are urged to move toward learner- and user-centered design in all phases of learning space planning. In addition, we are urged to "connect the dots" of the various learning spaces, seeing them as an overall campus learning space network or as a mesh of connected environments. Informal spaces should support and complement the formal ones and vice versa.

I began this piece by talking about inversions and how the approach to learning spaces advocated in these articles of *EDUCAUSE Review* represent an inversion of the traditional,

transmission-style model of learning. But in the end, the idea of inversion may not be, after all, the most useful metaphor to describe the transformation that is under way. Most inversions are temporary (as in meteorology) or somewhat artificial (as in the syntactic inversion in linguistics). Clearly, the transformation of higher education is neither temporary nor artificial (in the sense of being faddish). We can no more go back to the traditional educational model and its teaching spaces than the music industry can return to the traditional business model and its vinyl records and CDs. Thus we need to "invert the inversion"—so that the learner-centered learning space becomes the rule, rather than the exception.

Notes

1. Nancy Fried Foster and Susan Gibbons, eds., *Studying Students: The Undergraduate Research Project at the University of Rochester* (Chicago: Association of College and Research Libraries, 2007), <<http://docushare.lib.rochester.edu/docushare/dsweb/View/Collection-4436>>.
2. Joint Information Systems Committee (JISC), *Designing Space for Effective Learning: A Guide to 21st Century Learning Space Design*, 2006, p. 30, <<http://www.jisc.ac.uk/media/documents/publications/learningspaces.pdf>>.
3. The term is often attributed to Gaston Bachelard from his book *The Poetics of Space* (1958). There are collections of photos of desire paths in both Flickr and Google Images.
4. Malcolm B. Brown and Joan K. Lippincott, "Learning Spaces: More Than Meets the Eye," *EQ (EDUCAUSE Quarterly)*, no. 1 (2003), p. 15, <<http://net.educause.edu/ir/library/pdf/EQM0312.pdf>>.

