

# Learning Spaces

Diana G. Oblinger, Editor



EDUCAUSE

*Transforming Education*

*Through Information Technologies*

# Learning Spaces

Diana G. Oblinger, Editor

ISBN 0-9672853-7-2  
©2006 EDUCAUSE. Available electronically at  
[www.educause.edu/learningspaces](http://www.educause.edu/learningspaces)

An EDUCAUSE *e-Book*



---

# Learning Spaces

## Part 1: Principles and Practices

### Chapter 1: Space as a Change Agent

Diana G. Oblinger

• [Acknowledgments](#) • [Endnote](#) • [About the Author](#)

### Chapter 2: Challenging Traditional Assumptions and Rethinking Learning Spaces

Nancy Van Note Chism

• [Changing Our Assumptions](#) • [Intentionally Created Spaces](#) • [Opportunities and Barriers](#) • [Moving Forward](#) • [Hope for the Future](#) • [Endnotes](#) • [About the Author](#)

### Chapter 3: Seriously Cool Places: The Future of Learning-Centered Built Environments

William Dittoe

• [Marcy](#) • [The Learner-Centered Difference](#) • [Endnotes](#) • [About the Author](#)

### Chapter 4: Community: The Hidden Context for Learning

Deborah J. Bickford and David J. Wright

• [Why Community?](#) • [Community as a Context for Learning](#) • [Conclusion](#) • [Endnotes](#) • [About the Authors](#)

### Chapter 5: Student Practices and Their Impact on Learning Spaces

Cyprien Lomas and Diana G. Oblinger

• [Student Habits](#) • [Classrooms and Formal Spaces](#) • [Informal Spaces](#) • [What Colleges Can Do](#) • [Conclusion](#) • [Endnote](#) • [About the Authors](#)

ISBN 0-9672853-7-2

©2006 EDUCAUSE. Available electronically at

[www.educause.edu/learningspaces](http://www.educause.edu/learningspaces)

---

## **Chapter 6: The Psychology of Learning Environments**

Ken A. Graetz

- The Environmental Psychology of Teaching and Learning • Devices and Distraction in College Classrooms • Collaboration in the Classroom • Virtual Learning Environments • College Classrooms of Mystery and Enchantment • Endnotes • About the Author

## **Chapter 7: Linking the Information Commons to Learning**

Joan K. Lippincott

- Characterizing the Information Commons • Linking the Information Commons to Learning • Information Commons Development • Conclusion • Endnotes • About the Author

## **Chapter 8: Navigating Toward the Next-Generation Computer Lab**

Alan R. Cattier

- Informal Learning Spaces • The Case for Change • The Team • The Way to a New Approach • Endnote • About the Author

## **Chapter 9: Trends in Learning Space Design**

Malcolm Brown and Philip Long

- Trend 1: Active and Social Learning Strategies • Trend 2: Human-Centered Design • Trend 3: Devices That Enrich Learning • Conclusion • Further Reading • Endnotes • About the Authors

## **Chapter 10: Human-Centered Design Guidelines**

Lori Gee

- Foundations of the Guidelines • Characteristics of Human-Centered Guidelines • Conclusion • Endnotes • About the Author



---

**Chapter 11: Designing Blended Learning Space to the Student Experience**

Andrew J. Milne

• The Emerging Student Experience • The Disconnect Between High-Tech Learning Spaces and Current Design Practice • Moving Forward: A "Design Thinking" Approach • Conclusion • Endnotes • About the Author

**Chapter 12: Sustaining and Supporting Learning Spaces**

Christopher Johnson

• Funding • Instructional or Information Technology? • Supporting People • Conclusion • Endnotes • About the Author

**Chapter 13: Assessing Learning Spaces**

Sawyer Hunley and Molly Schaller

• Assessment Framework • Assessment Targets • Assessment Methods • An Example of Assessment • Practical Implications • Endnotes • About the Authors

**Part 2: Case Studies**

**Chapter 14: Learning How to See**

Diana G. Oblinger

• Space Shaped by Learning • Catalyzing Social Encounters • Shifting to Learning Complexes • Developing a Service Philosophy • Integrating Technology • Designing for Experimentation and Innovation • Involving Users • Conclusion • Endnotes • About the Author

**Chapter 15: City of London: The Sir John Cass Business School**

Clive Holtham

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Author

### **Chapter 16: Denison University: MIX Lab**

Scott Siddall

• Innovative Vision Yields Innovative Outcomes • Collaboration in Planning and Use • Transformed Space That Transforms the Curriculum • A Learning Space Driven by Design Principles • Endnote • About the Author

### **Chapter 17: Duke University: Perkins Library**

Marilyn M. Lombardi and Thomas B. Wall

• What Is It? • What Makes the Space Successful? • How Is Technology Used? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnotes • About the Authors

### **Chapter 18: Eckerd College: Peter H. Armacost Library**

J. Michael Barber

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnote • About the Author

### **Chapter 19: Estrella Mountain Community College: Learning Studios Project**

Homero Lopez and Lori Gee

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • For More Information • About the Authors

### **Chapter 20: Hamilton College: Science Center**

Nikki Reynolds and Douglas A. Weldon

• History • Process • The Building • About the Authors



---

**Chapter 21: Indiana University-Purdue University Indianapolis: The ES Corridor Project**

Nancy Van Note Chism

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnotes • About the Author

**Chapter 22: Iowa State University: LeBaron Hall Auditorium**

Jim Twetten

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnotes • About the Author

**Chapter 23: London School of Economics: BOX**

Andrew Harrison

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Acknowledgment • Endnotes • About the Author

**Chapter 24: Messiah College: Boyer Hall**

Dennis Lynch

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Author

**Chapter 25: Michigan Technological University: Center for Integrated Learning and Information Technology**

Paul Urbanek

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Author

---

### **Chapter 26: MIT: The Brain and Cognitive Sciences Complex**

Phillip D. Long

• What Is It? • What Happens Here? • What Makes the Space Successful? • What Principles Were Behind the Design? • How Is Technology Used? • What Is Unique or Noteworthy? • About the Author

### **Chapter 27: MIT: Steam Café**

Scott Francisco

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Acknowledgment • Endnote • About the Author

### **Chapter 28: North Carolina State University: Flyspace**

Hal Meeks

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Author

### **Chapter 29: North Carolina State University: SCALE-UP**

Robert Beichner

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnotes • About the Author

### **Chapter 30: Northwestern University: The Information Commons**

Bob Davis and Denise Shorey

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Authors





---

### **Chapter 31: The Ohio State University: The Digital Union**

Victoria Getis, Catherine Gynn, and Susan E. Metros

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Authors

### **Chapter 32: Olin College of Engineering: Academic and Olin Centers**

Joanne Kossuth

• About Olin • Type of Learning Spaces • Success • Principles • About the Author

### **Chapter 33: The Pennsylvania State University: Smeal College of Business**

Peter Nourjian

• What Is It? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Author

### **Chapter 34: St. Lawrence University: Center for Teaching and Learning**

Sondra Smith and Kim Mooney

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnote • About the Authors

### **Chapter 35: Stanford University: GroupSpaces**

Richard Holeton

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnotes • About of the Author

### **Chapter 36: Stanford University: Wallenberg Hall**

Dan Gilbert

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Author

### **Chapter 37: The University of Arizona: Manuel Pacheco Integrated Learning Center**

Christopher Johnson

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Author

### **Chapter 38: University of British Columbia: The Irving K. Barber Learning Centre**

Simon Neame and Cyprien Lomas

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • About the Authors

### **Chapter 39: University of Central Florida: Collaboration and Multimedia Classrooms**

Ruth Marshall

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Spaces Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnote • About the Author



---

**Chapter 40: University of Chicago: The USITE/Creerar Computing Cluster and Cybercafé**

Shirley Dugdale and Chad Kainz

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Acknowledgments • About the Authors

**Chapter 41: The University of Georgia: The Student Learning Center**

William Gray Potter and Florence E. King

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Endnotes • About the Authors

**Chapter 42: Virginia Tech: The Math Emporium**

Barbara L. Robinson and Anne H. Moore

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Unique or Noteworthy? • Community Asset • Endnote • About the Authors

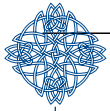
**Chapter 43: Virginia Tech: Torgersen Hall**

J. Thomas Head and Anne H. Moore

• What Is It? • What Happens Here? • How Is Technology Used? • What Makes the Space Successful? • What Principles Were Behind the Design? • What Is Noteworthy? • About the Authors

**Index**

A; B; C; D; E; F; G; H; I; J; K; L; M; N; O; P; Q; R; S; T; U; V; W; Z



# Space as a Change Agent

**Diana G. Oblinger**  
EDUCAUSE

*Spaces are themselves agents for change. Changed spaces will change practice.<sup>1</sup>*

Learning is the central activity of colleges and universities. Sometimes that learning occurs in classrooms (formal learning); other times it results from serendipitous interactions among individuals (informal learning). Space—whether physical or virtual—can have an impact on learning. It can bring people together; it can encourage exploration, collaboration, and discussion. Or, space can carry an unspoken message of silence and disconnectedness. More and more we see the power of *built pedagogy* (the ability of space to define how one teaches) in colleges and universities.

This e-book collection—chapters, examples, and images—presents learning space design from the perspective of those who create learning environments: faculty, learning technologists, librarians, and administrators. Other books focus on architectural and facilities issues; this e-book collection makes no attempt to duplicate them, despite their importance. This e-book focuses on less often discussed facets of learning space design: learner expectations, the principles and activities that facilitate learning, and the role of technology. Three trends catalyzed this collection:

- ▶ Changes in our students
- ▶ Information technology
- ▶ Our understanding of learning

Today's students—whether 18, 22, or 55—have attitudes, expectations, and constraints that differ from those of students even 10 years ago. Learning spaces often reflect the people and learning approach of the times, so spaces designed in 1956 are not likely to fit perfectly with students in 2006.

Many of today's learners favor active, participatory, experiential learning—the learning style they exhibit in their personal lives. But their behavior may not match their self-expressed learning preferences when sitting in a large lecture hall with

©2006 Diana G. Oblinger

---

chairs bolted to the floor. The single focal point at the front of the room sends a strong signal about how learning will occur. A central theme of this e-book is how to reconceptualize learning spaces to facilitate active, social, and experiential learning.

Students are also highly social, connecting with friends, family, and faculty face-to-face and online. They say they find great value in being with other people and want their college experience to promote those connections. Yet the way they establish and maintain their personal and professional networks may be anything but traditional. Facebook.com, instant messaging, and cell-phone photos coexist with conversations over coffee.

To most faculty and administrators, students appear to have no fear of technology. Mobile phones, digital cameras, and MP3 players constitute today's backpack. Browsing, downloading, and messaging happen anywhere and anytime.

Another characteristic of students has an impact on space: time constraints. The majority of today's students work part time (often 30 or more hours per week), commute, and have outside responsibilities. Even traditional-age, residential students exhibit the most common student characteristic: lack of time. With student attention pulled in multiple directions, how can learning spaces bring students and faculty together, ensuring that the environment promotes, rather than constrains, learning?

Information technology has changed what we do and how we do it. It would be hard to identify a discipline in which IT is not a necessity. Collecting, analyzing, displaying, and disseminating knowledge typically involves IT. Retrieving information has become an IT function; students consider the Internet, not the library, their information universe. And, rather than trying to know everything, students and faculty rely on networks of peers and databases of information. What impact, if any, should this have on learning space design?

Technology has also brought unique capabilities to learning. Whether by stimulating more interaction through the use of personal response systems or by videoconferencing with international experts, IT has altered learning spaces.

What we know about how people learn has also changed our ideas about learning space. There is value from bumping into someone and having a casual conversation. There is value from hands-on, active learning as well as from discussion and reflection. There is value in being able to receive immediate support when needed and from being able to integrate multiple activities

(such as writing, searching, and computing) to complete a project. And, there is value from learning that occurs in authentic settings, such as an estuary or on a trading floor. How do we turn the entire campus—and many places off campus—into an integrated learning environment?

As we have come to understand more about learners, how people learn, and technology, our notions of effective learning spaces have changed. Increasingly, those spaces are flexible and networked, bringing together formal and informal activities in a seamless environment that acknowledges that learning can occur anyplace, at any time, in either physical or virtual spaces. We have also come to understand that design is a process, not a product. Involving all stakeholders—particularly learners—is essential.

This e-book represents an ongoing exploration. We know that space can have a significant impact on teaching and learning. Exactly how we bring together space, technology, and pedagogy will continue to evolve. I hope you will find this exploration of learning spaces helpful as you and your institution work to ensure learner success.

## Acknowledgments

I'd like to thank this e-book's authors for their insightful contributions. I'd also like to thank Cyprien Lomas and Chris Johnson for their help identifying many of the cases that make this collection so valuable.

## Endnote

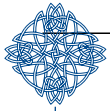
1. Joint Information Systems Committee (JISC), *Designing Space for Effective Learning: A Guide to 21st Century Learning Space Design*, p. 30, <[http://www.jisc.ac.uk/uploaded\\_documents/JISClearningspaces.pdf](http://www.jisc.ac.uk/uploaded_documents/JISClearningspaces.pdf)>.

## About the Author

**Diana G. Oblinger** is a vice president at EDUCAUSE, where she directs the EDUCAUSE Learning Initiative (ELI). Previously Oblinger served as the vice president for information resources and the chief information officer for the 16-campus University of North Carolina system and as a senior fellow for the EDUCAUSE Center for Applied Research (ECAR). Prior to that she was the executive director of higher education for Microsoft Corporation and led the Institute for Academic Technology for IBM. Oblinger was on the faculty at Michigan State University and the University of Missouri–Columbia, where

---

she also served as an academic dean. Oblinger has authored and edited numerous books and publications, including the award-winning *What Business Wants from Higher Education* and the first EDUCAUSE e-book, *Educating the Net Generation*, with James L. Oblinger.



# Challenging Traditional Assumptions and Rethinking Learning Spaces

**Nancy Van Note Chism**

*Indiana University-Purdue University Indianapolis and Indiana University*



- ▶ A student relaxing in the grass with a laptop
- ▶ Several hundred students listening in a lecture hall
- ▶ Students working together at an outdoor table
- ▶ A student studying in his residence hall lounge
- ▶ A student reading a book in a window well
- ▶ A group of students mixing solutions in a laboratory

These learning scenarios occur whether we arrange the spaces or not. We can facilitate deeper and richer learning when we design spaces with learning in mind.

©2006 Nancy Van Note Chism



Learning takes place everywhere on a college campus. In fact, learning arguably happens everywhere—on city sidewalks, in airplanes, in restaurants, in bookstores, and on playgrounds. Human beings—wherever they are—have the capacity to learn through their experiences and reflections.

Institutions of higher education are charged with fostering specific kinds of learning: higher-order thinking abilities, communication skills, and knowledge of the ways of disciplinary experts, to name a few. Educators must create structures that support this learning. Space can have a powerful impact on learning; we cannot overlook space in our attempts to accomplish our goals.

Torin Monahan used the term “built pedagogy” to refer to “architectural embodiments of educational philosophies.” In other words, the ways in which a space is designed shape the learning that happens in that space.<sup>1</sup> Examples surround us. A room with rows of tablet arm chairs facing an instructor’s desk in front of chalkboards conveys the pedagogical approach “I talk or demonstrate; you listen or observe.” A room of square tables with a chair on each side conveys the importance of teamwork and interaction to learning. (See Figures 1 and 2.)

**Figure 1.** Traditional Class



**Figure 2.** Remodeled Class



Strange and Banning<sup>2</sup> asserted that “although features of the physical environment lend themselves theoretically to all possibilities, the layout, location, and arrangement of space and facilities render some behaviors much more likely, and thus more probable, than others.” Because we habitually take space arrangements for granted, we often fail to notice the ways in which space constrains or enhances what we intend to accomplish. Chism and Bickford<sup>3</sup> listed a number of typical assumptions:

- ▶ Learning only happens in classrooms.
- ▶ Learning only happens at fixed times.
- ▶ Learning is an individual activity.
- ▶ What happens in classrooms is pretty much the same from class to class and day to day.
- ▶ A classroom always has a front.
- ▶ Learning demands privacy and the removal of distractions.
- ▶ Flexibility can be enhanced by filling rooms with as many chairs as will fit.
- ▶ Higher education students are juvenile:
  - ▷ They will destroy or steal expensive furnishings.
  - ▷ They need to be confined to tablet arm chairs to feel like students.
  - ▷ They are all small, young, nimble, and without disabilities.
- ▶ Amplification is necessary in large rooms only to make the instructor or technology audible.

---

## Changing Our Assumptions

Why challenge these assumptions? Because of

- ▶ literature on the influence of physical space on human activity,
- ▶ cognitive theory, and
- ▶ descriptions of the new student demographics.

### Space and Activity

The influence of physical space on human activity has been studied from both psychological and physical perspectives. The field of environmental psychology explores such topics as place attachment, psychological comfort with space, and the motivational and inspirational effects of space. Those who study space from a physical viewpoint are interested in the effects on activity of light, temperature, and physical closeness. From the literature applied to learning spaces in higher education, we can extrapolate some general patterns.

Strange and Banning<sup>4</sup> emphasized the ways in which the physical aspects of a campus convey nonverbal messages—welcoming or discouraging, valuing or disrespecting—even more powerfully than verbal messages. They cited research that links the physical attractiveness and lighting of a space to the motivation and task performance of those in the space. Graetz and Goliber<sup>5</sup> summarized research that links lighting to psychological arousal, overheated spaces to hostility, and density with low student achievement. Scott-Webber<sup>6</sup> reviewed research on how space makes us feel and related it to knowledge creation, communication, and application, arguing that space configurations exert powerful influences on these activities.

### Cognitive Theory

Advances in learning theory<sup>7</sup> have clear implications for the ways in which learning most likely takes place. The emphasis today is on active construction of knowledge by the learner. The importance of prior experience, the fitting of knowledge into existing schema or the establishment of new schema, and the active processing of information are all components of this model that emphasize high learner involvement. Environments that provide experience, stimulate the senses, encourage the exchange of information, and offer opportunities for rehearsal, feedback, application, and transfer are most likely to support learning.

Additionally, social constructivists point out that the social setting greatly influences learning. Picture the limitations of the standard classroom or study carrel in terms of these ideas. The decor is sterile and unstimulating; the seating arrangements rarely allow for peer-to-peer exchange; and the technology does not allow individual access to information as needed. Rather, the room supports a transmission theory whose built pedagogy says that one person will “transfer” information to others who will “take it in” at the same rate by focusing on the person at the front of the room.

Moving beyond classrooms to informal learning spaces, the typical unadorned corridors where students pass from class to class and sit on benches looking forward in parallel or sit on the floor outside classroom spaces say something similar: students do not learn until they are in the “learning space” where a teacher presents information. The segmentation of faculty offices from classrooms increases this distance and lack of agency on the part of students and reinforces the transmitter image of the faculty member. Rather than appearing to be a co-learner, the faculty member is set apart. Similarly, computer labs that do not provide for multiple viewers of a monitor or libraries that do not permit talking convey a built pedagogy contrary to the ideas of social constructivism.

### Demographics of the Student Population

Descriptions of the characteristics of traditional-age college students provide a rationale for challenging our space use. The entry of large numbers of previously underrepresented students—students from ethnic cultures that stress social interaction, older students, students blending work and learning—also calls for environments in which social interchange and experiential learning are valued. This demographic picture also favors standard adult furniture over juvenile tablet arm desks.

The argument doesn’t include just nontraditional students, however. Characterizations of Net Generation students<sup>8</sup> extend similar considerations to current traditional students in reinforcing the need for social space and technology access. Brown<sup>9</sup> listed these implications for space, depicting a different built pedagogy than normally present in higher education. He cited the preference of Net Gen students for:

- ▶ Small group work spaces
- ▶ Access to tutors, experts, and faculty in the learning space
- ▶ Table space for a variety of tools

- ▶ Integrated lab facilities
- ▶ IT highly integrated into all aspects of learning spaces
- ▶ Availability of labs, equipment, and access to primary resources
- ▶ Accessible facilities
- ▶ Shared screens (either projector or LCD); availability of printing
- ▶ Workgroup facilitation

The advent of distance courses has done much to dispel the idea that learning happens only in a classroom, yet the reality of how dated our standing assumptions are continues to unfold. Podcasting of lectures can both extend the lecture hall and make its spatial arrangement far more specialized than normally assumed. As Mitchell<sup>10</sup> pointed out, “If you get wireless reception under a tree, there really isn’t any need to be in a classroom.” Smaller places for debriefing, project work, discussion, and application of information become paramount. Outdoor spaces, lobby spaces, cafés, and residence halls all need to be considered in terms of how they can support learning.

### Intentionally Created Spaces

Spaces that are harmonious with learning theory and the needs of current students reflect several elements:

- ▶ **Flexibility.** A group of learners should be able to move from listening to one speaker (traditional lecture or demonstration) to working in groups (team or project-based activities) to working independently (reading, writing, or accessing print or electronic resources). While specialized places for each kind of activity (the lecture hall, laboratory, and library carrel) can accommodate each kind of work, the flow of activities is often immediate. It makes better sense to construct spaces capable of quick reconfiguration to support different kinds of activity—moveable tables and chairs, for example.
- ▶ **Comfort.** At a recent town hall meeting on the campus of Indiana University-Purdue University Indianapolis (IUPUI), faculty were startled to hear two of four student panelists confess that they had dropped classes because of uncomfortable chairs in the classrooms. Such testimony takes our normally casual attitude about comfort into the realm of attrition. Campus seating must take into account different body sizes and the long periods of time students must sit without moving. Discomfort makes a compelling distraction to learning. We should also provide surfaces for writing and supporting computers, books, and other materials. The small, sloping surfaces

on most standard tablet arm chairs are inadequate for these purposes. The chairs also presume a standard space for the girths of the occupants and their arm reach.

- ▶ **Sensory stimulation.** Antiseptic environments consisting of white rectangles with overhead lights and bland tiled floors create a mood for the occupants of these spaces. Human beings yearn for color, natural and task-appropriate lighting, and interesting room shapes. The current generation of students, attuned to home remodeling television shows and examples of stimulating spaces in the coffee shops and clubs they frequent, seem particularly sensitive to ambiance. One study<sup>11</sup> found that the majority of students, male and female, continually rearranged their living spaces to be more attractive. In evaluating a model learning space, they noted the paint colors, carpeting, and lighting without prompting.
- ▶ **Technology support.** As Oblinger,<sup>12</sup> Oblinger and Oblinger,<sup>13</sup> and Brown<sup>14</sup> pointed out, the current generation of students expects seamless technology use. Their older counterparts and teachers would appreciate the same capability. As technology changes, smaller devices will probably travel with users, who will expect wireless environments, the capacity to network with other devices and display vehicles, and access to power. Rather than cumbersome rack systems and fixed ceiling-mounted projectors, learning spaces of the future will need more flexible plug-and-play capabilities.
- ▶ **Decenteredness.** Emphasizing the principles of socioconstructivism, spaces must convey co-learning and co-construction of knowledge. Implications for architecture include thinking of the whole campus as a learning space rather than emphasizing classrooms. Within the classroom, it means avoiding the message that the room has a front or a “privileged” space. Outside the classroom, it means providing ubiquitous places for discussion and study. It means that the flow of spaces—from library to faculty or administrative offices to classrooms and the corridors and outdoor passageways in between—must be rethought in terms of learning. Spaces should center on learning, not experts.

Consider the following examples of experiments with spaces centered on learning:

- ▶ **The studio classroom.** This arrangement introduces flexible furniture arrangements, decenters the room from teacher to student activity, and stresses collaboration. From the early models at Rensselaer Polytechnic Institute

---

to current spaces at North Carolina State University (<http://www.ncsu.edu/PER/SCALEUP/Classrooms.html>, ch. 29) to current models at the University of Dayton (<http://lrc.udayton.edu/faculty/studio.htm>, chs. 3, 4, 13) and Stanford University (<http://wallenberg.stanford.edu/>, ch. 36), such spaces are becoming more common. An example of an extended studio model is the Math Emporium at Virginia Tech (ch. 42). The new auditorium design employed at Iowa State University is another example described in this book (ch. 22).

- ▶ **Information Commons/Collaboratory.** Increasingly, campus libraries are recognizing the need for study spaces that permit interaction among students. Furniture, computer displays, and space arrangements all support group work. Examples can be found at [http://www.brookdale.cc.nj.us/library/infocommons/ic\\_home.html](http://www.brookdale.cc.nj.us/library/infocommons/ic_home.html). Examples of information commons arrangements described in this book include those at the [University of Georgia](#), [Duke University](#), [Northwestern University](#), and [The Ohio State University](#).
- ▶ **Living-learning spaces.** Moving academic work into student residences through scheduling classes or other learning activities within living facilities integrates courses with student life. The ArtStreet project (<http://artstreet.udayton.edu/>, ch. 13) at the University of Dayton integrates studios, a café, living facilities, and galleries in one complex. New campus residences elsewhere include meeting rooms for classes right in the living facilities.
- ▶ **Corridor niches.** No longer simply passageways, corridors in some buildings serve as study and meeting space. See the case study in this book on the [ES Corridor Project at IUPUI](#) for an example. An additional example in this book is found in the commons spaces near faculty offices and informal study spaces at [Hamilton College](#).

## Opportunities and Barriers

Our current learning spaces present several opportunities, as well as substantial barriers. The opportunities include enrollment growth and the competition for students—factors already leading to construction of new facilities with modernized learning spaces, as well as climbing walls. Technology, which allows ubiquitous access to information and learning environments, also enables different uses of physical space. Yet traditional space standards on the books of most colleges and universities direct those planning and constructing new facilities in “old paradigm” ways of thinking. Moreover, faculty

who are uninformed of new advances in learning theory or unwilling to make adjustments in their normal approaches pose significant barriers to change. Tight fiscal conditions, especially in public and small private institutions, also constrain what can be done.

## Moving Forward

In their recent study of institutions that do exceptionally well in engaging their students, Kuh et al.<sup>15</sup> discovered that the physical environment is an important characteristic of such campuses. One of the main recommendations from their study is that institutions “align the physical environment with institutional priorities and goals for student success.” To exploit the potential for physical space to advance learning, conversations about campus priorities must include space as a critical factor affecting learning. The perceived urgency of the conversation changes dramatically when framed in terms of learning impact rather than student comfort or preference.

Helping the campus community understand how spatial arrangements preclude or support retention, graduation, pedagogical innovation, and a host of campus priorities is an essential first step. From governing boards and legislatures (in the case of public institutions) to central administration, facilities planners, maintenance operations, faculty, and students, all must realize that good space is not a luxury but a key determinant of good learning environments.

Understanding then must lead to advocacy on a number of issues:

- ▶ Changing antiquated space standards and decision-making processes
- ▶ Dispelling long-held assumptions about students and space (“I learned in hard chairs in the heat, and they can too,” “Students will steal anything not nailed down,” “Students will ruin anything upholstered or carpeted with their carelessness,” “Windows distract students from paying attention”)
- ▶ Putting learning considerations at the heart of space-planning conversations
- ▶ Arguing for resources for space renovation and construction

The cultural change required in thinking of space in a new way should not be underestimated. We need to ask such basic questions as “Should rooms have a front and a back?” “Should faculty offices be separate from classroom facilities?” “Should food and talking be allowed in the library?” As Scott-Webber<sup>16</sup> pointed out, our sense of space is one of the most primal of human instincts. Deeply engrained attitudes about space in colleges and universities mean it will take patience and persistence to make changes, particularly more radical ones.



---

## sample content of Learning Spaces

- [Commodity Derivatives: Markets and Applications \(The Wiley Finance Series\) book](#)
- [Giorgio Agamben: Power, Law and the Uses of Criticism \(Nomikoi Critical Legal Thinkers\) online](#)
- [Journey Into Space online](#)
- [download \*The Definitive Guide to Thriving After Cancer: A Five-Step Integrative Plan to Reduce the Risk of Recurrence and Build Lifelong Health\*](#)
- [Puppet 3 Cookbook online](#)
- [Time and the Digital: Connecting Technology, Aesthetics, and a Process Philosophy of Time \(Interfaces: Studies in Visual Culture\) pdf, azw \(kindle\), epub](#)
  
- <http://fortune-touko.com/library/Commodity-Derivatives--Markets-and-Applications--The-Wiley-Finance-Series-.pdf>
- <http://test.markblaustein.com/library/Giorgio-Agamben--Power--Law-and-the-Uses-of-Criticism--Nomikoi-Critical-Legal-Thinkers-.pdf>
- <http://chelseaprintandpublishing.com/?freebooks/Talking-Heads--Fear-of-Music--33-1-3-Series-.pdf>
- <http://betsy.wesleychapelcomputerrepair.com/library/Learning-Data-Mining-with-R.pdf>
- <http://musor.ruspb.info/?library/Puppet-3-Cookbook.pdf>
- <http://transtrade.cz/?ebooks/Time-and-the-Digital--Connecting-Technology--Aesthetics--and-a-Process-Philosophy-of-Time--Interfaces--Studies->