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Keynote Address Slides

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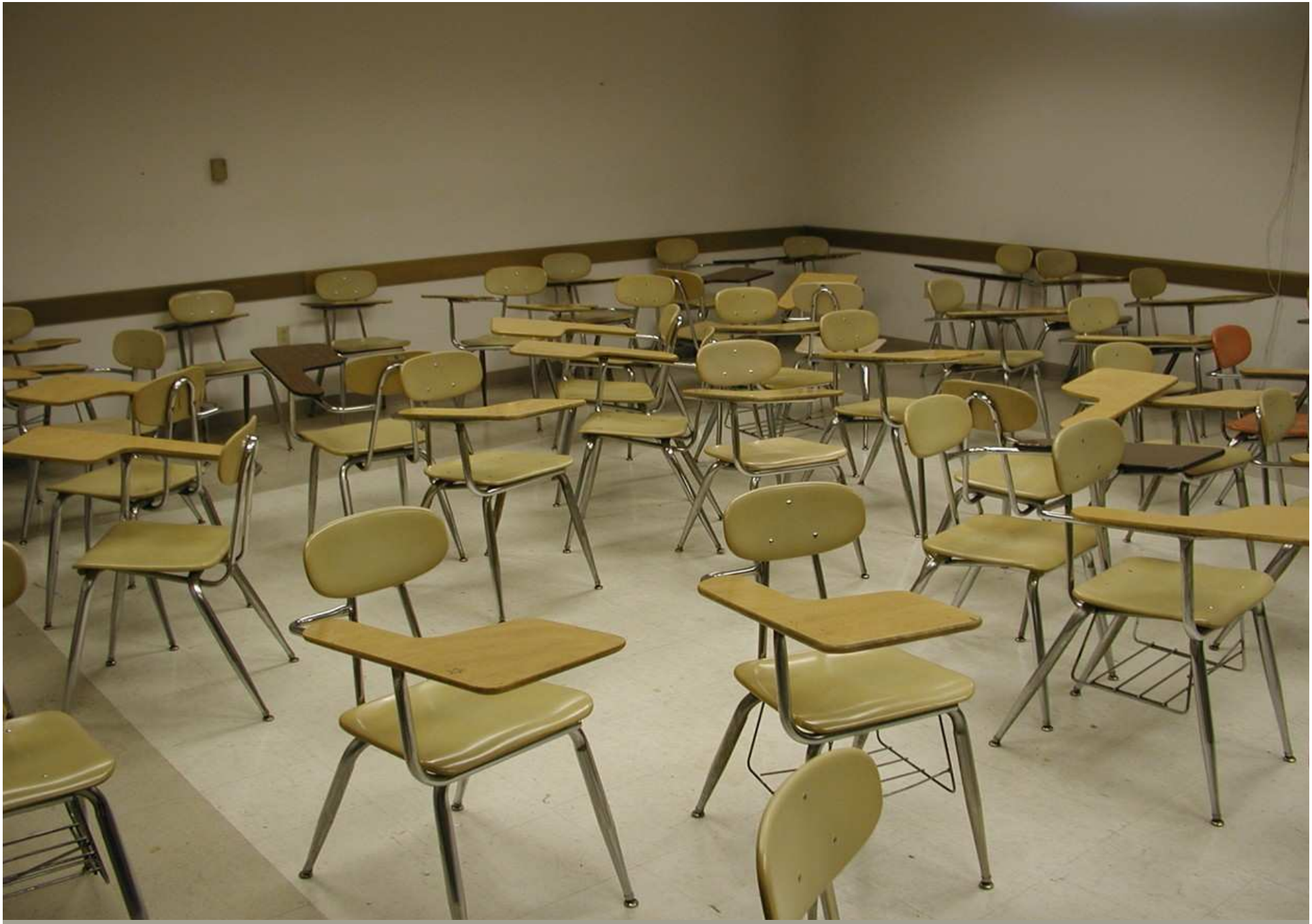
Notes have been added for clarification. Follow-up questions and discussion are always welcome.


Messages from Space



Structure

The challenge
What we have to work with
How learning has changed
Where learning happens
What we can do with what we have
Where to start

Challenge

- More cost-effective learning
- Improving the learning and teaching environment with increasingly limited resources
- What this means:
  - More learning per square foot
  - More teaching per square foot
  - Identifying and exploiting where learning best happens
- Importance of not going backwards in a recession
- Not more space but different space

MIT Stata Center, Frank Gehry, architect

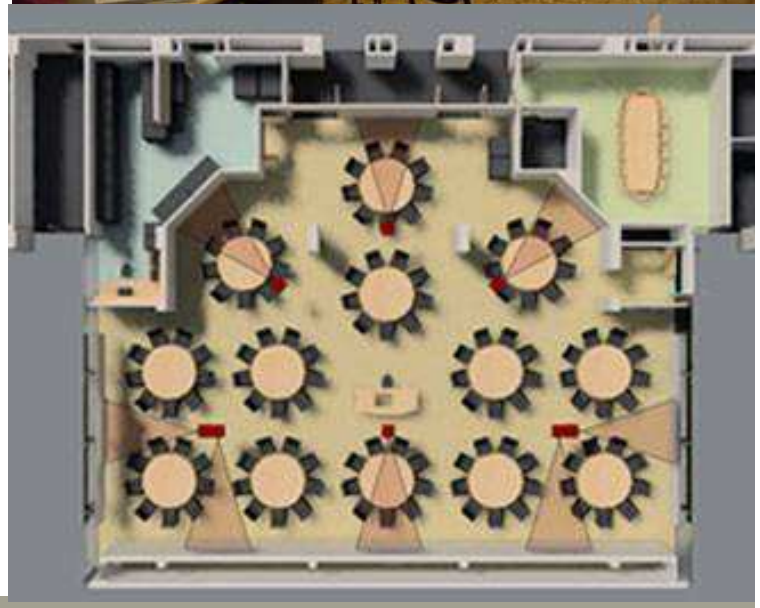
Course Redesign Context

Five Principles

- Redesign the whole course.
- Encourage active learning
- Provide students with individualized assistance
- Build in ongoing assessment and prompt (automated) feedback
- Ensure sufficient time on task and monitor student progress

Six Models

- Supplemental
- Replacement
- Emporium
- Fully Online
- Buffet
- Linked workshop



http://web.mit.edu/edtech/casestudies/teal.html

…and speaking of money…

We should be thinking about learning per square foot, not square feet per FTSE student

Seeing the whole campus (the whole system) as a classroom reveals:

- Limitations of net-to-gross concepts of building efficiency; unassignable space is often the most important in building a learning community
- State funding mechanisms often obstruct the development of the smart campus
- Compartmentalized concepts of efficiency lead to inefficiencies
- Locus of decision-making for facilities investment can prevent properly targeted investment

Costs and space

	1973	2004	Growth
Average Space per Student (gsf) (SCUP – 2004 figure is estimate)	300	880	295%
Average size of American home (gsf) (NPR)	1,500	2,349	157%

- Facilities arms race: colleges and universities completed $15 billion worth of building in 2006
- Tripling of space per student on some campuses
- Emphasis on marketing or learning?
- Cost of a classroom – ca. $150 per student per course

What we have to work with

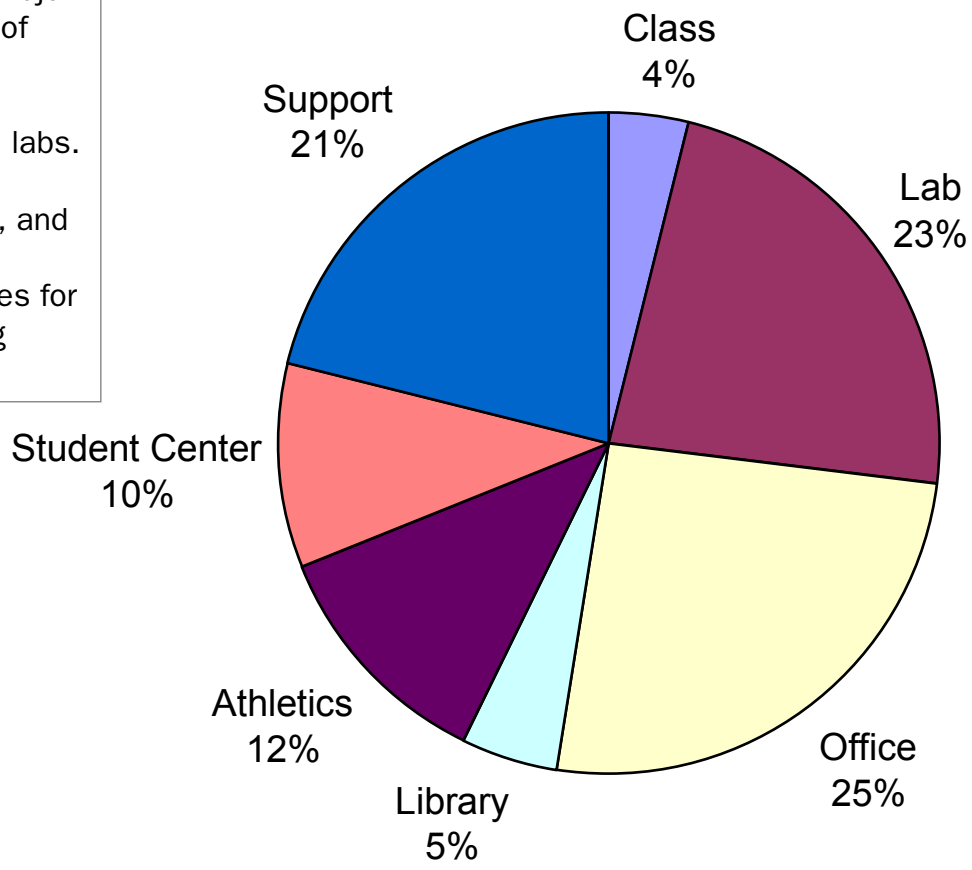
- Space allocation systems
- Seventies buildings
- Massive expansion of square footage in past decade
- Lack of improvement to existing buildings
  - Cost of technology has taken money from investment in space
- Classrooms
- Lecture halls
- Seminar rooms
- Labs
  - Computer labs
  - Science, engineering, other labs
- Libraries
- Offices
- Student centers
- Rec centers
- Dormitories

How space is used

Support includes parking garages, which are a major feature on campuses of research institutions.

Labs include research labs.

Student center, office, and library space offers significant opportunities for rethinking the learning environment

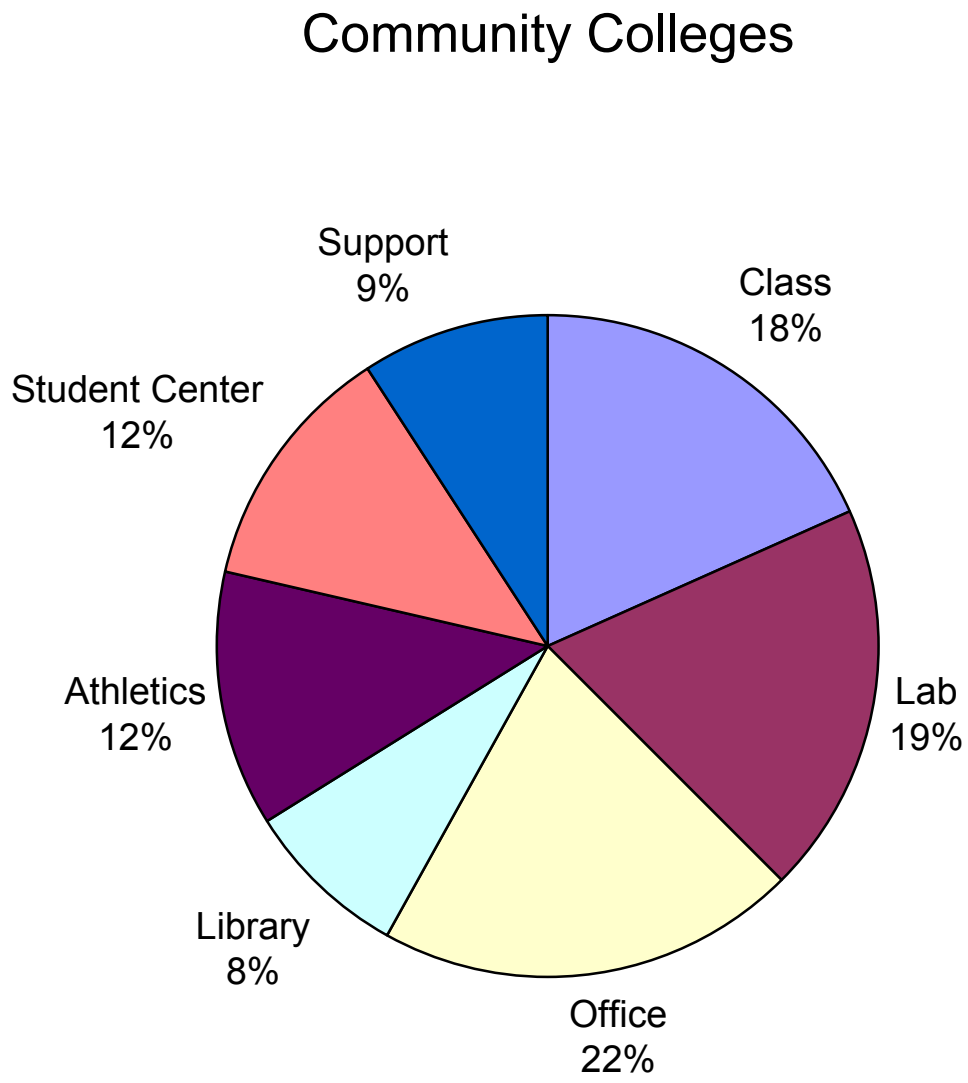


Data from approx. 80 institutions in Sasaki database.

The learning environment is clearly much more than classrooms,
and we need to look beyond the classroom is we are to meet the needs of course redesign.

We need smart campuses, not just smart classrooms

How space is used

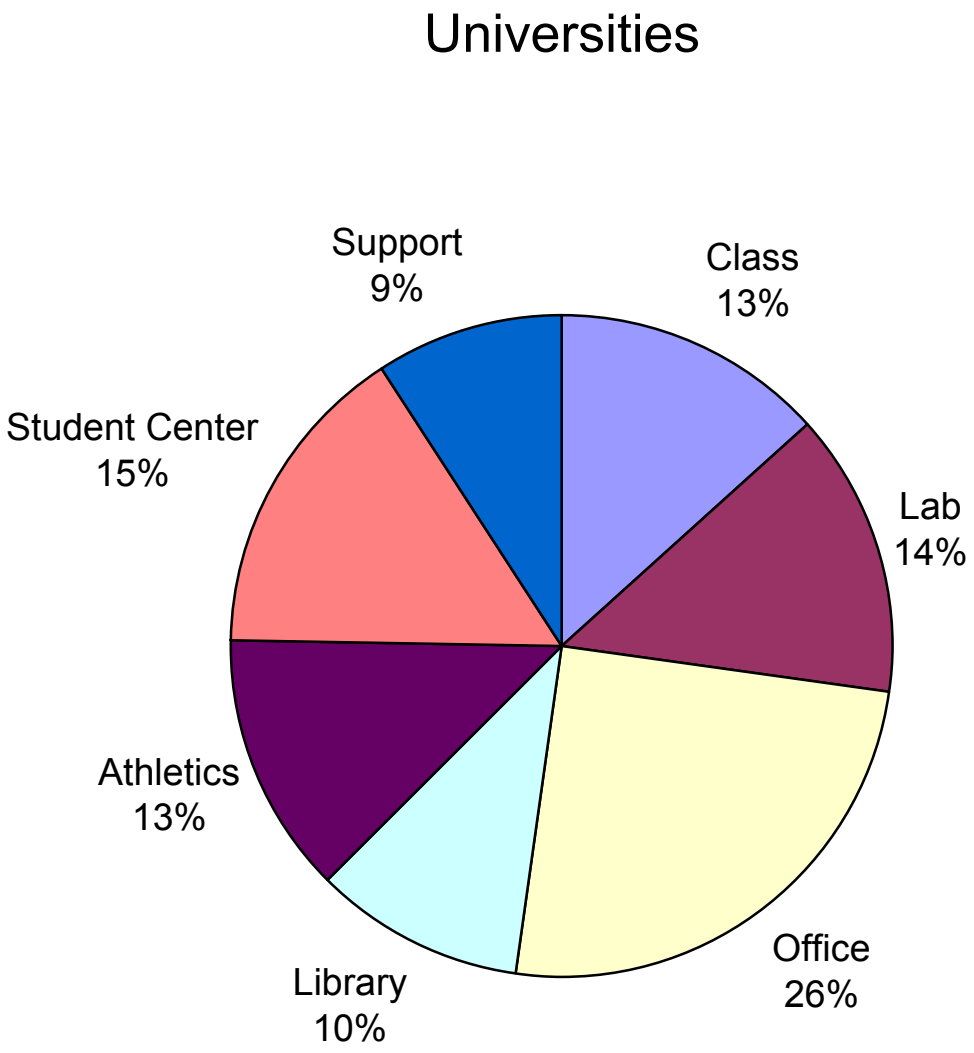


Community colleges tend to have a lot less flexibility in space use than research universities.

Rethinking labs and lab use, and rethinking the library are probably the best areas to review.

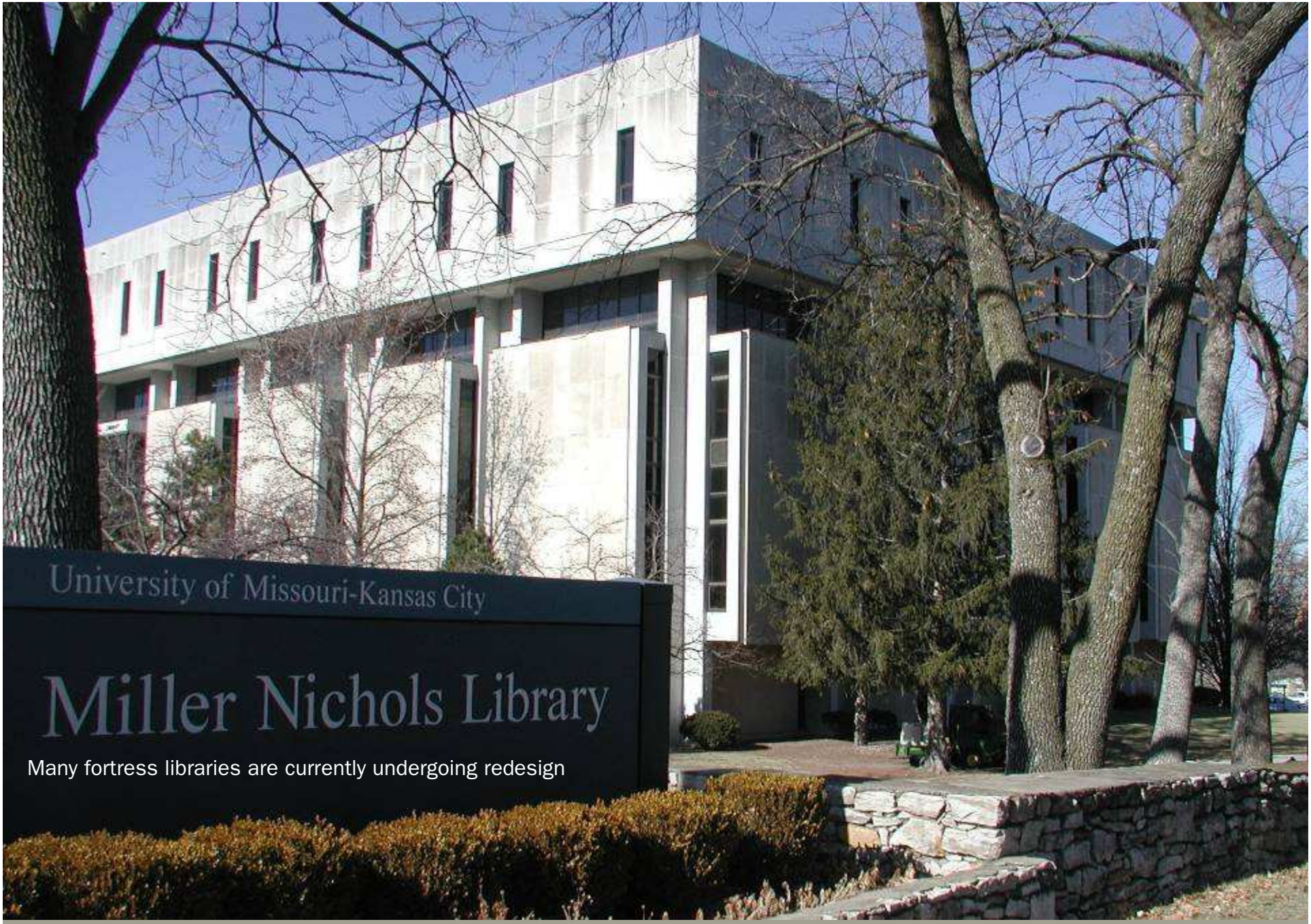
Student centers in community colleges also need to be thought of a work areas or study areas, as well as social spaces.

How space is used



Four year institutions have much more flexibility than community colleges, and tend to have built a large amount of student support space in the past 10—15 years. Rethinking the library, office and student center areas could yield real improvements to the learning environment.

Challenging buildings from the Sixties and Seventies are commonplace on most of the nation's campuses



Many fortress libraries are currently undergoing redesign

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Stacks today are little used, and take up considerable space in libraries.
Remote or compact storage is frequently adopted as a solution

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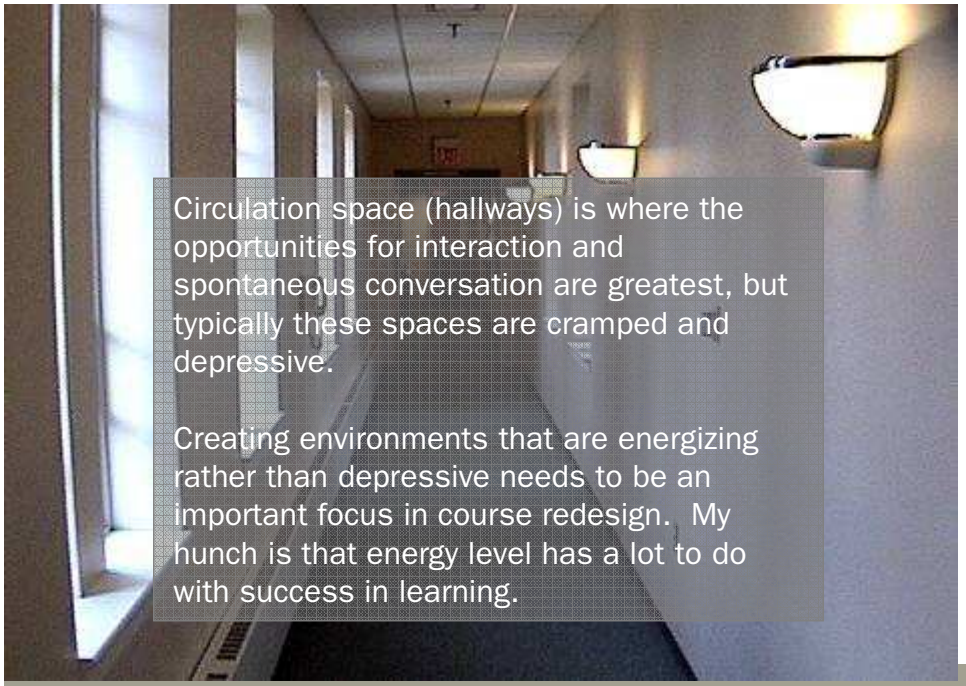
The configuration of faculty work areas often seems at odds with today's emphasis on collaboration, productivity, and student access.

In the typical faculty work area, such as this, there is little incentive to come to work, and no way of knowing who is around, if anyone.

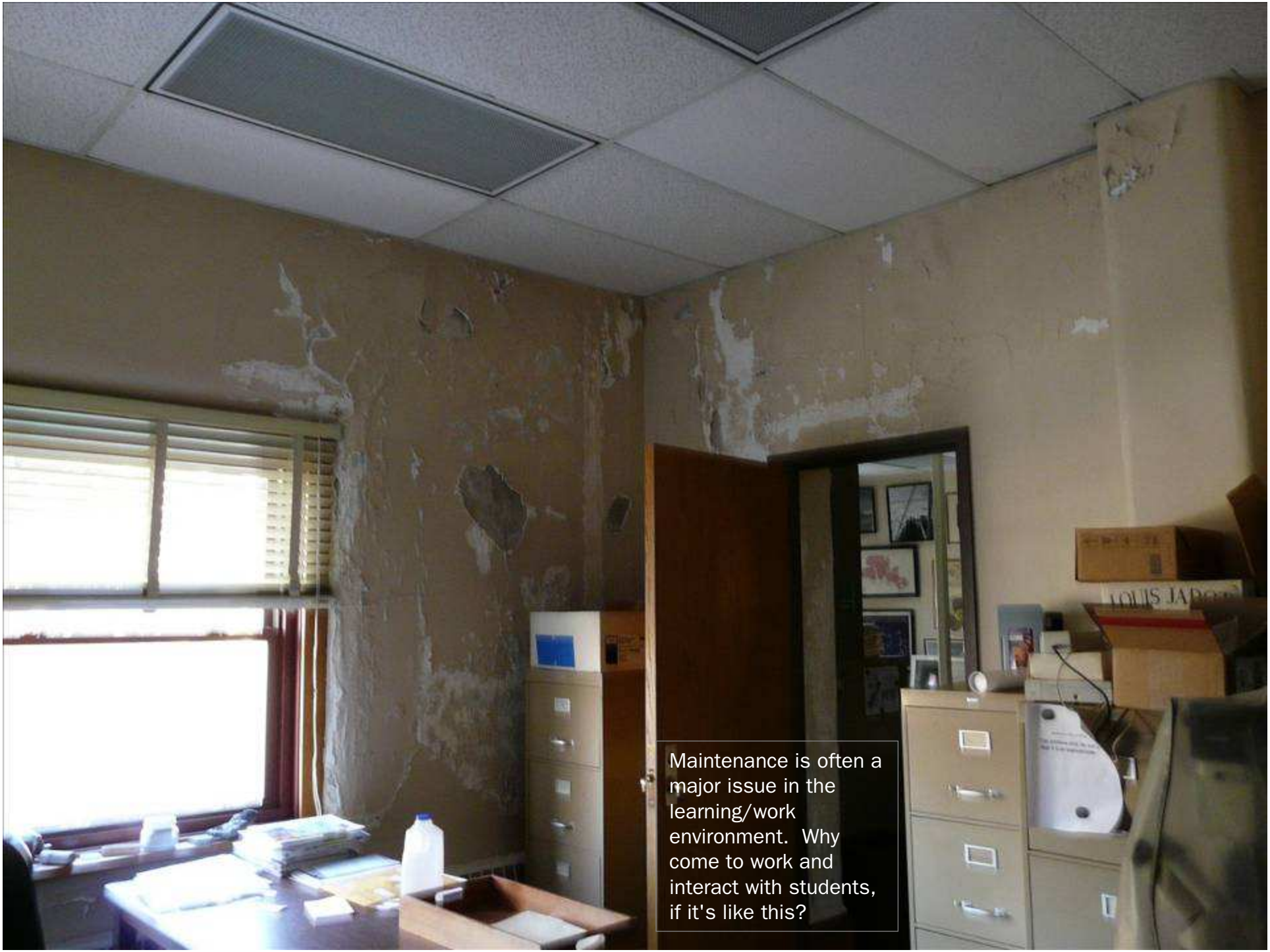
Some people suggest that the average faculty office is empty 80% of the time, while the faculty office is the largest space consumer on campus.

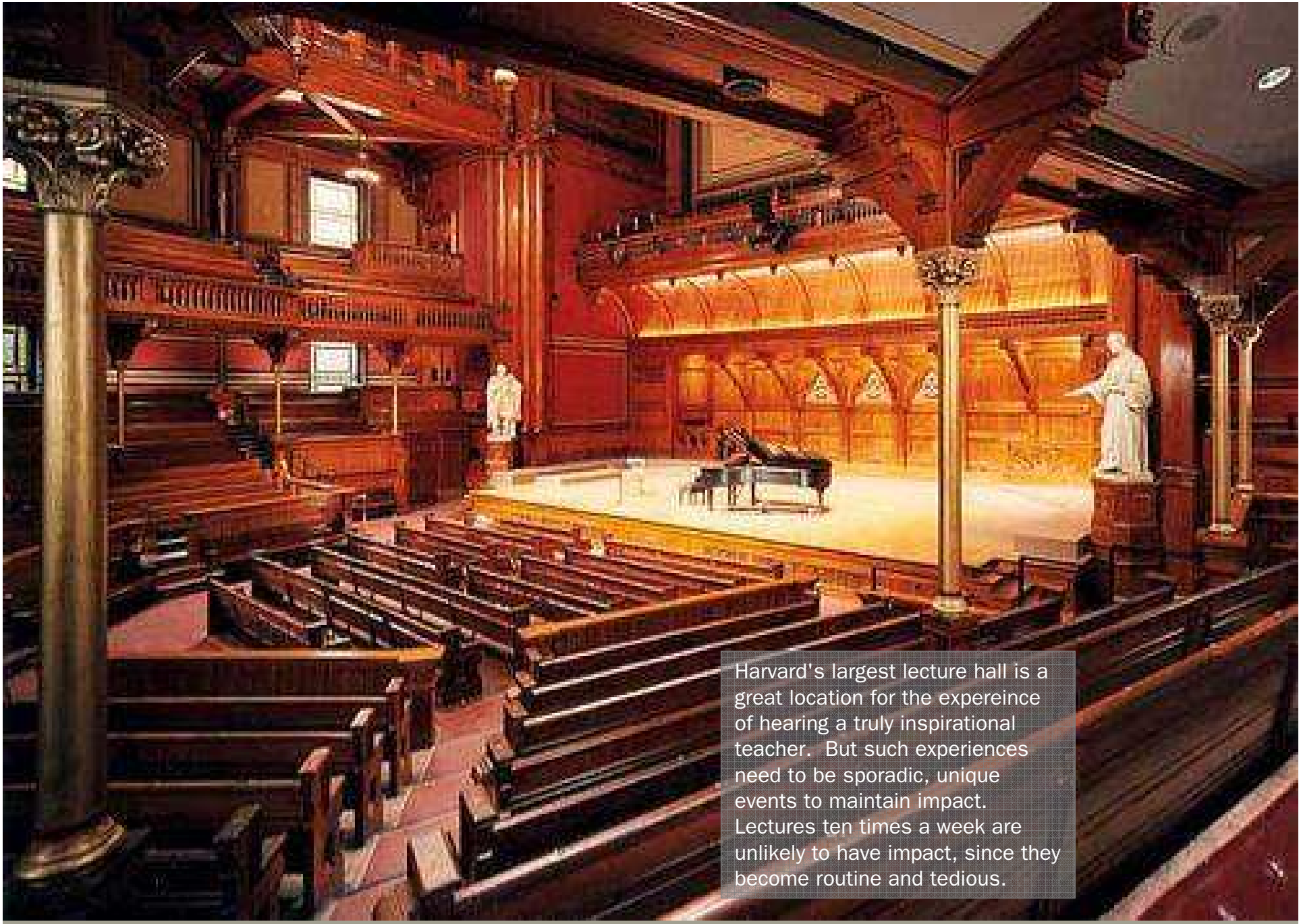


Circulation space (hallways) is where the opportunities for interaction and spontaneous conversation are greatest, but typically these spaces are cramped and depressive.

Creating environments that are energizing rather than depressive needs to be an important focus in course redesign. My hunch is that energy level has a lot to do with success in learning.

Where students hang out before or after class is potentially an ideal learning environment, but is often more like this.


Maintenance is often a major issue in the learning/work environment. Why come to work and interact with students, if it's like this?

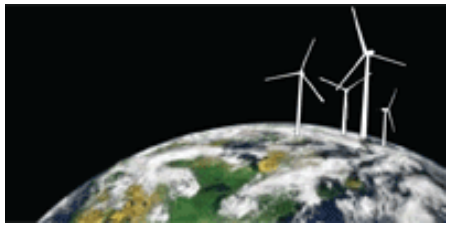


Harvard's largest lecture hall is a great location for the expereince of hearing a truly inspirational teacher. But such experiences need to be sporadic, unique events to maintain impact. Lectures ten times a week are unlikely to have impact, since they become routine and tedious.

THE GREENING OF HIGHER ED

COLLEGE SUSTAINABILITY REPORT CARD FINDINGS

- The percentage of schools with green building policies increased from 48% to 69% from 2006 to 2007
- The number of schools committed to reducing carbon emissions tripled from 14% to 50% from 2006 to 2007
- Endowment investments in renewable energy funds more than tripled from 9% to 31% from 2006 to 2007
- 42% of campuses have hybrid or electric vehicles
- More than 1 in 3 schools have full-time staff dedicated to sustainability
- Schools are tackling complex environmental problems with cross-disciplinary research, preparing students to think collaboratively



Source: Sustainable Endowments Institute, *College Sustainability Report Card 2008*.
Statistics are on the colleges and universities with the 200 largest endowments in the United States and Canada

THE GREENING OF HIGHER ED

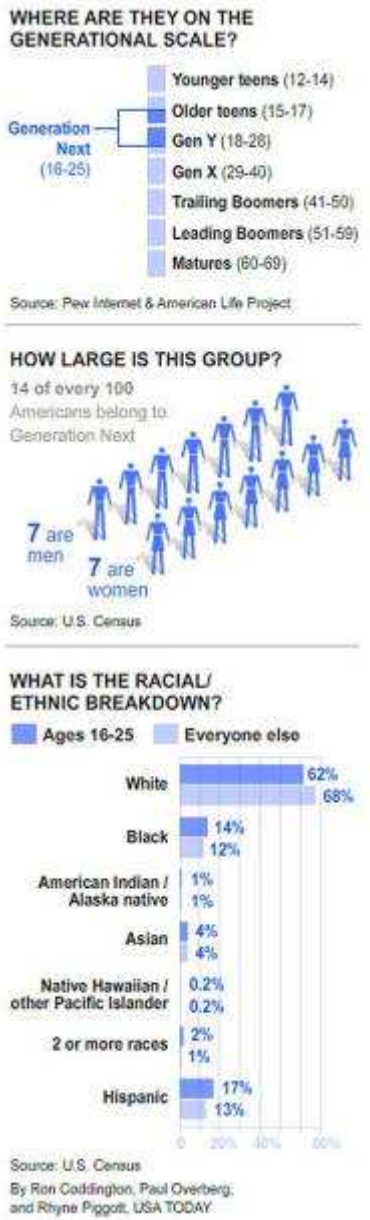
The greenest new building is no new building!

For most institutions, what we need is not more buildings but better buildings. We need to create an energized work environment, that incorporates the best principles of sustainability.

The "triple bottom line" approach sustainability includes social and economic issues, as well as environmental issues, and is consequently well aligned with the course redesign agenda.

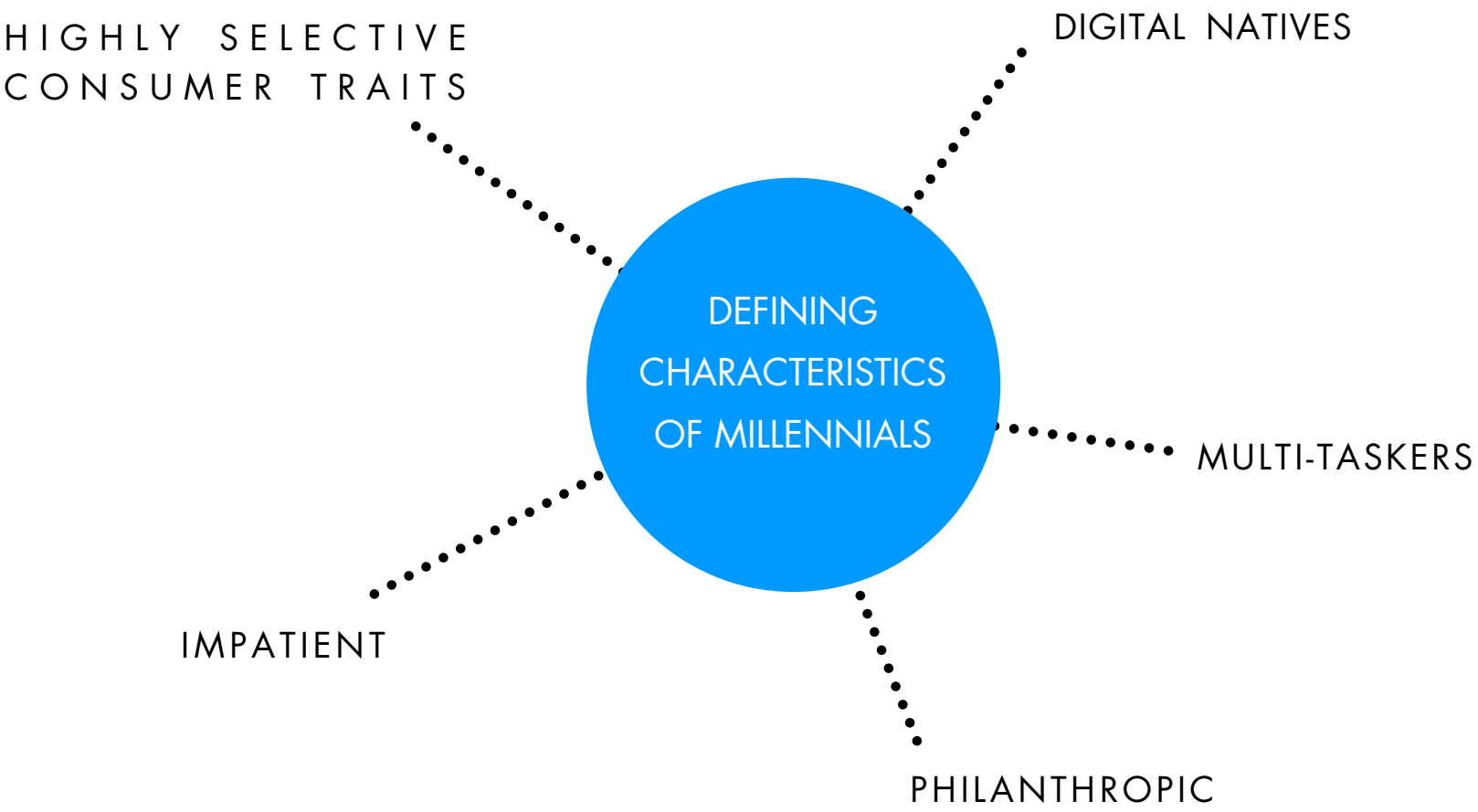
DEMOGRAPHICS

- New generation of students→ Millennials
- Born between 1982 – 1994
- The second largest generation in US history (second only to baby boomers)
- Over half of millennials are of voting age
- Millennials will be attending colleges and universities through 2017
- The single largest birth year was 1990, with the largest cohort entering college in 2008



Source: NJIT, Sweeney

DEMOGRAPHICS



Source: NJIT, Sweeney

EVOLVING LEARNING STYLES

NEW LEARNING STYLES
Peer-to-peer learning
Collaborative
Value engagement and experience
Visual and kinetic
Experiential learning
Service learning

→ NEW LEARNING ENVIRONMENTS
Flexible learning spaces
Self-directed learning spaces
Informal learning spaces
Interdisciplinary spaces
Multi-purpose spaces
Learning commons
Virtual spaces

TRANSFORMING LEARNING SPACES

Light Visibility Informality

Morgan State University, Architecture by Sasaki Associates

Trends

Informal Learning

Architecture by Sasaki Associates

Trends

Informal Learning

EVOLVING LEARNING STYLES

SELF-DIRECTED LEARNING SPACES

- Modeled after corporate research centers
- Quiet contemplative spaces as well as social spaces
- Separate project rooms adjacent to classrooms

St. Olaf College, Northfield MN

University of North Carolina, Chapel Hill NC

Putnam, Norwood MA

EVOLVING LEARNING STYLES

INFORMAL LEARNING SPACES

- Group projects and group study are critical for active roles in a collaborative world
- Group study occurs in and out of classrooms, libraries, residence halls and informal study areas
- Informal spaces emerging as key demonstration spaces
- Repurposing of circulation space to promote learning

Drexel University, Philadelphia PA

UOIT, Ontario

MIT, Cambridge MA

Olin College, Needham MA

EVOLVING LEARNING STYLES

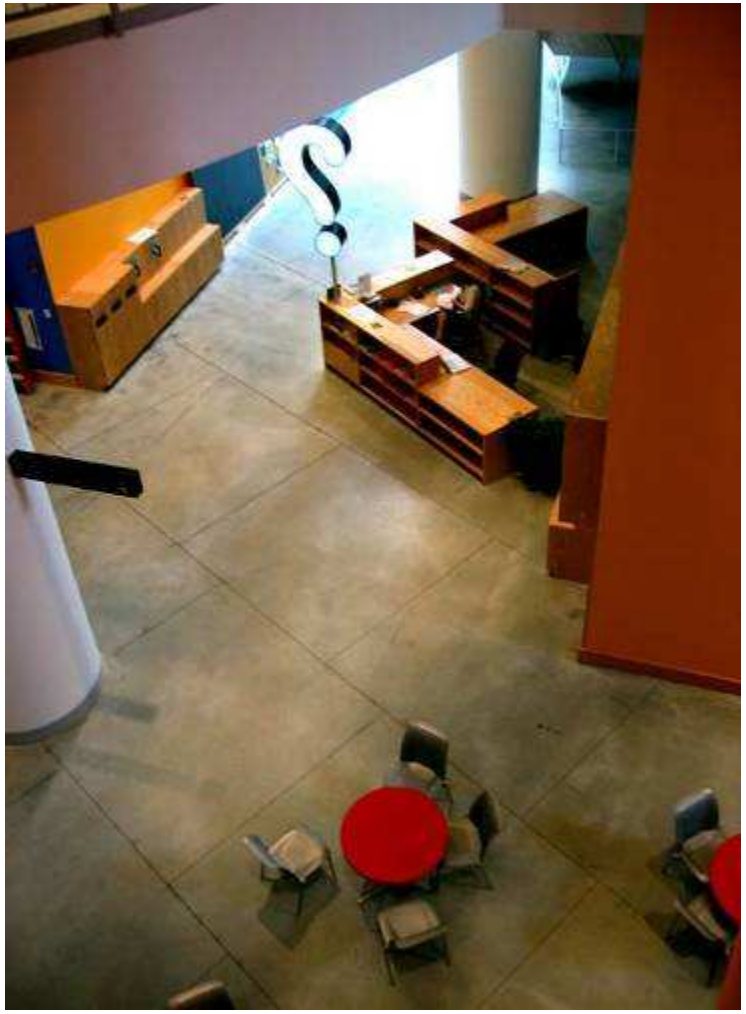
INTERDISCIPLINARY SPACES – MIT STATA CENTER

Programs

- Computer science
- Information / intelligence sciences
- Linguistics
- Philosophy

Spaces

- Flexible research facilities
- Classrooms
- Auditorium
- Social spaces
- Fitness facilities
- Childcare center



EVOLVING LEARNING STYLES

ROLE OF THE LIBRARY

- Information Commons → Digital Commons
- Increasingly caters to collaborative learning
- Repurposing of desktop computer labs
- New library elements include:
  - Social spaces
  - Informal spaces
  - Teaching spaces / smart classrooms
  - Group study spaces
  - Collaboration spaces
  - Technology centers
  - Coffee shops and cafes

Washington University, St Louis MO

UOIT, Oshawa Ontario

EVOLVING LEARNING STYLES

VIRTUAL SPACES

- Increased reliance on online course management systems, data sharing, instant messaging and virtual learning environments for instructional purposes
- Second Life: Real time educational gaming environment
  - Types of spaces
    - Classrooms
    - Amphitheaters
    - Libraries and Art Galleries
    - Social Spaces
    - Visitor and Resource Centers
  - Over 8 million Second Life accounts created since 2003
  - Over 170 educational institutions had accounts as of 2007, including MIT, Harvard, NYU and Stanford

Campus Tour

Amphitheater

Art Gallery at Ohio University

Seven principles of learning

1. Learning is fundamentally social.

2. Learning is integrated into the life of communities.

3. Learning is an act of participation.

4. Knowing depends on engagement in practice.

5. Engagement is inseparable from empowerment.

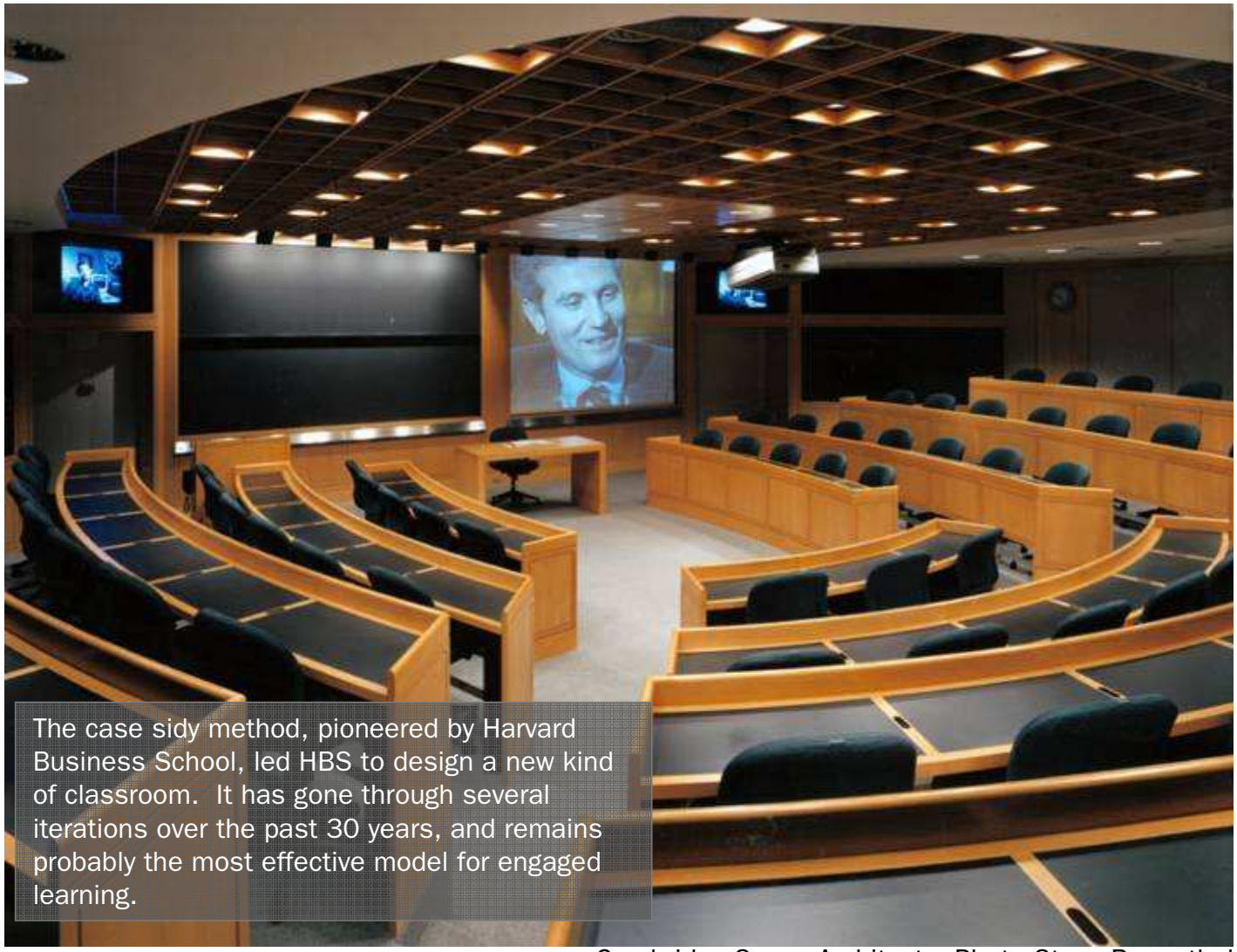
6. Failure to learn is the result of exclusion from participation.

7. People are natural lifelong learners.

Quoted from Institute for Research on Learning


Traditional lecture halls are found around the world, and are clearly not designed for engaged learning.
Sookmyung Women's University, Seoul, Korea

Harvard Business School



The case sidy method, pioneered by Harvard Business School, led HBS to design a new kind of classroom. It has gone through several iterations over the past 30 years, and remains probably the most effective model for engaged learning.

Cambridge Seven Architects, Photo Steve Rosenthal

Students and their notebooks at The Missouri School of Journalism

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Dialogue or Monologue

Discomfort
Over heating
Bad lighting
Invisible fellow-students
Limited work surfaces

Ease of movement & flexibility for the instructor
Easy formation of groups
Encouragement of dialog
Adequate writing surfaces
Fix setup combines order and flexibility
Improved lighting

Two of the most heavily used classrooms in a liberal arts college – one before renovation, and one after. The college reported that over 60% of time in class was focused in discussion, so classrooms were redesigned to support this.

Miller, Dyer, Spears Architects

Smart or not-so-smart

A projector and screen do not necessarily make a smart classroom. A smart classroom is one that encourages more engaged pedagogy.

Smart Classrooms

'Learning spaces of the 21st century need to foster discovery, innovation and scholarship, and not simply contain them.'

Malcolm Brown and Phillip Long, Learning Spaces

Flexible furniture and variations in table shape change the learning environment. Individual screens can be an obstacle to communication.

MIT TEAL Classroom Miller Dyer Spears Architect

Classroom or call center?

Learning Centers

Y-shaped computer clusters in a sunken, daylighted space surrounded by classrooms and offices. Students taking classes in this space have contract access to help.

Maricopa Community College, Tech Center, Mesa Campus

Learning Centers

While this kind of layout is efficient in terms of space use, it encourages solitary rather than collaborative work.

Math resource center

This Math Resource Center at Maricopa Community College's Mesa campus combines a testing center, faculty offices, and open study and tutoring areas.

Libraries

In many libraries, former stack areas are now informal study areas and learning support areas.

Often the books are moved to compact storage, as here, and there is more space for study – in a wireless environment. Libraries also provide a range of spaces, from social to quiet.

The new library at Lorain Community College combines group study spaces, informal work areas, access to technology and print reference materials.

Sasaki Associates, Architect

Student Centers

UC Santa Barbara, Student Resource Building

Sasaki Associates, Architect

In many ways, libraries and student centers has a major overlap how they are used. In we replace the super graphic ICE CREAM with SHAKESPEARE, this space could be a library.

University of Delaware, Venturi Scott Brown Associares Architect

SASAKI

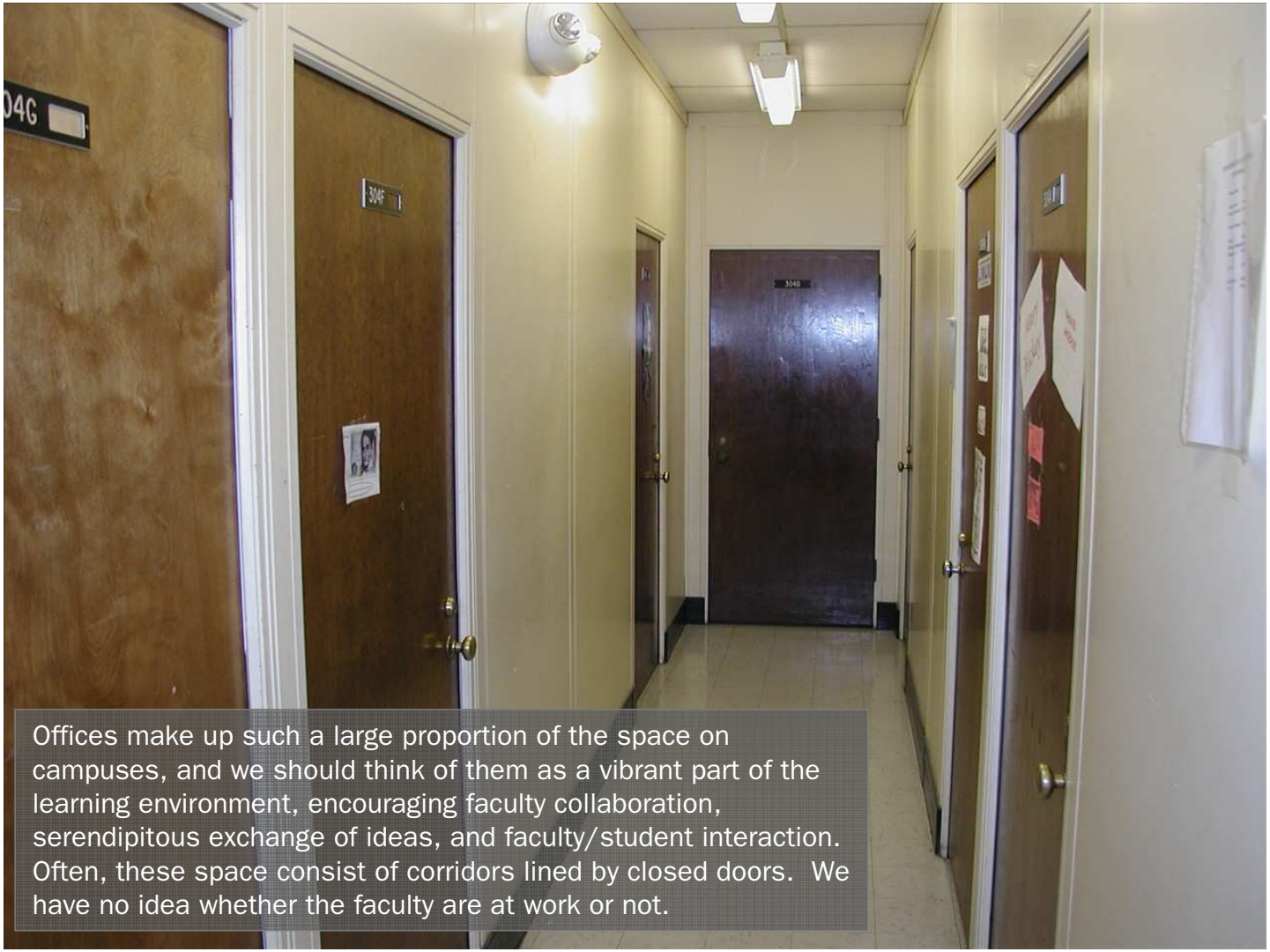

And here the distinction between library and student center is blurred. Which is it?

Learning Happens Everywhere

Coffer houses are exemplary in providing a highly efficient learning space, while making money at the same time. Here, students are working individually and in groups, with and without technology.

Recreation centers, now ubiquitous on college campuses, are potentially highly effective learning environments., particularly with text to speech now available on devices such as the Kindle.

The workplace



Offices make up such a large proportion of the space on campuses, and we should think of them as a vibrant part of the learning environment, encouraging faculty collaboration, serendipitous exchange of ideas, and faculty/student interaction. Often, these space consist of corridors lined by closed doors. We have no idea whether the faculty are at work or not.

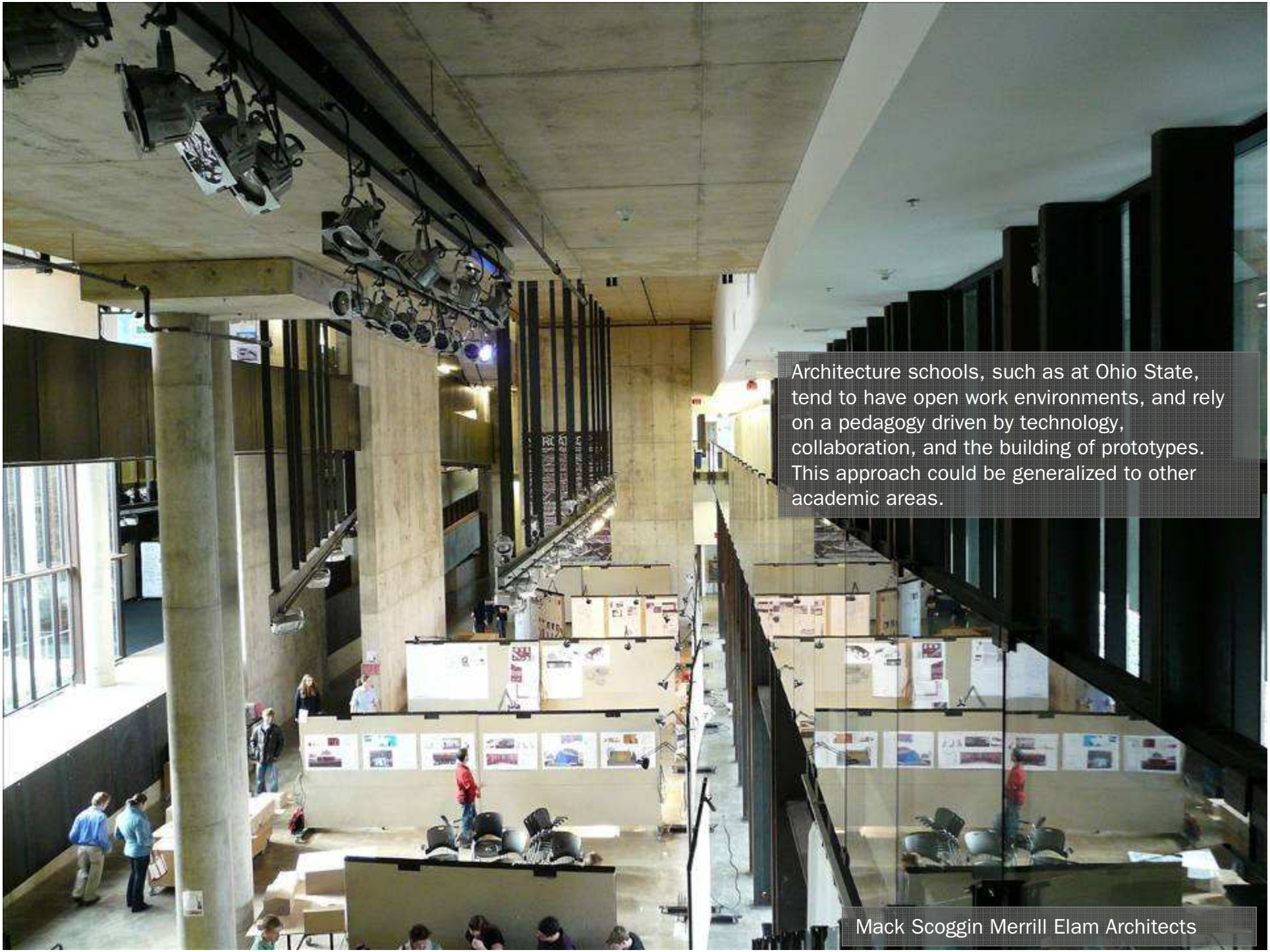
LEARNING FROM THE PRIVATE SECTOR

Work areas in the private sector are designed for sharing, collaboration, and increased transparency. These workplaces are also highly committed to maximum productivity. Increased productivity should similarly be a major goal in higher education. We tend to focus on student productivity, but faculty productivity is also a major issues.

LEARNING FROM THE PRIVATE SECTOR

Green buildings, with a major focus on natural light, fresh air, and transparent, as well as a range of environmental strategies, also improve collaboration and create incentives for workers.

Gemzyme Center, Cambridge Mass. Behnisch Architekten



Architecture schools, such as at Ohio State, tend to have open work environments, and rely on a pedagogy driven by technology, collaboration, and the building of prototypes. This approach could be generalized to other academic areas.

Mack Scoggin Merrill Elam Architects

At Sasaki Associates in Watertown, Massachusetts, 300 professions work in an open environment, focused on collaboration and discovery – and very much reliant on technology.

SASAKI

At Sasaki Associates in Watertown, Massachusetts, 300 professions work in an open environment, focused on collaboration and discovery – and very much reliant on technology.

Principles

- Focus place-based learning on the primacy of interaction: faculty/student, student/student, faculty/faculty
- Provide centralized resources for learning, to complement distributed resources
- Offer comprehensive student services
- Create a work-oriented place-based community
- Make the campus a cherished resource, a real destination, rather than a perfunctory experience, for commuter students
- Allow less frequent visits to campus to become more meaningful (and reduce carbon footprint!)

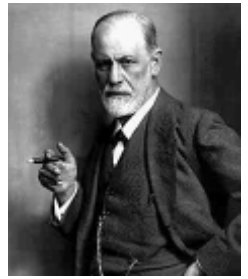
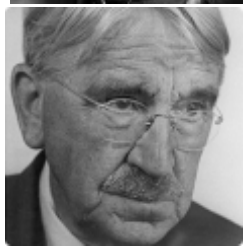
Ideas – for new and existing

- Build hybrid buildings – don't silo your spaces
- Design for student demographics
- Design for how students actually live and work
- Invest in technology outside the classroom
- Build an environment where coming to work is a pleasure
- End the tyranny pf "net to gross"
- Bring in daylight and fresh air

- Expand the use of what you have:
  - Faculty office areas
  - Student centers
  - Dining halls
  - Rec centers
  - Coffee houses
  - Dormitories
  - Libraries
- Create interaction spaces in classroom buildings
- Refurnish classrooms – introduce flexibility, increase sf per student
- Use community resources

People

- Sigmund Freud
  - Love and work are the cornerstones of our humanness"
- John Dewey
  - "Education is a social process"
- Roger Schank
  - "Learning should be one third looking at a computer, one third working in a group, and one third making something"
- John Seely Brown
  - *The Social Life of Information*
- Carol Twigg
  - "People are getting over their infatuation with technology and are starting to think more seriously about how it can be used to make a real difference in student learning"


How to start

- Complete a comprehensive assessment of your campus as a learning environment
  - Faculty work areas
  - Library
  - Student center
  - Residence halls
  - Rec center
  - Classrooms and labs
- How well does it support your vision of course redesign?

- Reward those who redesign with physical improvements to support their vision