Design of the Learning Space

Photo courtesy of Alan Levine
Introductions

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Introductions

• Name
• Role at your institution
• Type of Institution
• Why you are here
What we won’t talk about

• Specifics

• ...connection to other domains
A framework for the design of learning space

- Assessment
- Design Principles
- Learning Activities
- Lay of the Land
- Institutional Context
- Learning Principles
Why is it important to think about designing space?

- Does space have an effect on learning?
- How?
What is a learning space

Formal
What is a learning space

Formal

- Studio
- Lab
- Classroom
- Performance Room
- Auditorium
- Computer Lab
What is a learning space

Formal
- Studio
- Lab
- Classroom
- Performance Room
- Auditorium
- Computer Lab

Informal
What is a learning space

Formal
- Classroom
- Lab
- Studio
- Performance Room
- Auditorium
- Computer Lab

Informal
- Library
- Hallways
- Offices
- Courtyards
- Cafeteria
- Plazas
Virtual Space

- Wikis
- Gaming
- PDAs
- Blogs
- Cell Phones
- Social Networks
- CMS’s
- RSS
- Digital Stories
- Wireless
- Instant Messaging
Common Themes

- HVAC
- Lighting
- Student Density
- Things we don’t talk about
Good teaching can sometimes overcome bad space
But bad space often wins
Why should I care about space?

- We spend a large number of hours designing innovative methods of instruction
Why should I care about space?

- We spend a large number of hours designing innovative methods of instruction, and then use the same boxes we’ve been using for the past 100 years.
Why should I care about space?

- Students spend less than 10% of their time in class in a semester
- Students increasingly craft their own learning outside of the classroom
Traditional Design Process

A sequential process with up and over communications, driven by less than complete and consistent requirements centered on the change of space.

- Request from department to the university
- Formal approval by university
- University project manager hires architects and construction company
- Architect elicits needs of the department in programming phase
- Design performed by architects, focusing on offices, labs, classrooms, building systems, driven by space needs
- Periodic reviews with representatives of department and university
Why should I care about design principles?
Or - Our Last Design Meeting
Which usually leads to this
Or this

“Technology is the black hole of all funding!”
A new process

• The new learning environment can be viewed as a product/system that must be developed
• The client is expert in system development
• The architect is expert in space development
Design principles provide a common language that allows you to consistently communicate to a broad audience the requirements needed to achieve your outcomes, based on learning.
Design Principles

- Allow you to facilitate learning principles and activities
- Describe what (most) teachers and students should be able to do; ideally their activities
- May conflict with one another
- Are complemented by other kinds of design inputs (e.g., the budget; need for flexibility)
Design Principles

• Design principles do not describe specific spaces or tools used to carry out activities

• These are not examples of design principles:
  • U-shaped seating in tiers
  • Students learn well
  • Faculty not embarrassed
Beginning the process

Assessment
Design Principles
Learning Activities

Lay of the Land
Institutional Context
Learning Principles
New and Old Assumptions About Space

New

Learning only happens in the classroom

Old

Learning happens anywhere

N. Chism and D. Bickford, 2002
New and Old Assumptions About Space

New

Learning happens at fixed times

Old

Learning happens anytime

N. Chism and D Bickford, 2002
New and Old Assumptions About Space

New

Learning is an individual activity

Old

Learning is influenced by social environments

N. Chism and D. Bickford, 2002
New and Old Assumptions About Space

**New**

A classroom always has a front

**Old**

Configuration depends on the activity

N. Chism and D Bickford, 2002
New and Old Assumptions About Space

New
Learning demands privacy and the removal of distractions

Old
Learning is aided by openness and stimuli

N. Chism and D Bickford, 2002
New and Old Assumptions About Space

New

Windows distract students from learning

Old

Windows provide needed light and openness

N. Chism and D. Bickford, 2002
Lay of the Land
Life Cycles
Lay of the Land
Life Cycles

• Can we be sure that the spaces built today will still be useful later in their life-cycle?
• How do we support, update, and modify these spaces in a rapidly changing environment?
• In other words, how do we remain agile throughout the process.
Lay of the Land
How People Learn
Lay of the Land
How People Learn

• What learning theories and practices meet our instructional needs, as well as the learning needs of our students?”

• What cultural values do we wish to preserve? - Ours and our students’
Lay of the Land
Technology

Timing – The Hype Cycle

<table>
<thead>
<tr>
<th>KEY</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will reach the “plateau” in:</td>
<td></td>
</tr>
<tr>
<td>• Less than two years</td>
<td></td>
</tr>
<tr>
<td>• Two to five years</td>
<td></td>
</tr>
<tr>
<td>• Five to 10 years</td>
<td></td>
</tr>
<tr>
<td>• More than 10 years</td>
<td></td>
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</tbody>
</table>

- Technology Trigger
- Peak of Inflated Expectations
- Trough of Disillusionment
- Slope of Enlightenment
- Plateau of Productivity

- Linux
- Bluetooth
- Biometrics
- Wearable Computers
- Synthetic Characters
- Text Mining
- Digital Ink
- Quantum Computing
- Java Language
- PDAs
- Data Mining
- XDSL/Cable Modems
- 3D Web
- Smart Cards
- Speech Recognition

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Lay of the Land
Technology

• Will this technology facilitate the learning principles we want?
• Will the technology support the learning activities we design?
• Will the technology support the learning skills we want them to learn?
Lay of the Land
The Net Gen
Lay of the Land
The Net Gen

- What skills and preferences do students currently have?
- What skills will they have in the future?
- What skills will they need?
- How will we meet these needs?
Beginning the process

Assessment

Design Principles

Learning Activities

Lay of the Land

Institutional Context

Learning Principles
What is our institutional context?
What is our institutional context?

• Does the space fit with our values and goals?
• Does the space fit into the overall campus plan?
• Is there sufficient budget to build, support, and modify the space?
Deciding what’s important

Assessment

Design Principles

Learning Activities

Lay of the Land

Institutional Context

Learning Principles
What is a learning principle?

- A set of principles (statements) that define good practice and provide clear benchmarks for learning.
Where can you find learning principles?

- Partnership for 21st Century Skills
- Learner–Centered Psychological Principles (American Psychological Association)
- Seven Principles for Good Practice in Undergraduate Education
Good Practice in Undergraduate Education

- Encourages contact between students and faculty.
- Develops reciprocity and cooperation among students.
- Uses active learning techniques.
- Gives prompt feedback.
- Emphasizes time on task.
- Communicates high expectations.
- Respects diverse talents and ways of learning.

Seven Principles for Good Practice in Undergraduate Education
By Arthur W. Chickering and Zelda F. Gamson
From the March 1987 AAHE Bulletin
Learner-Centered Psychological Principles

- **Cognitive and Metacognitive Factors**
  - Nature of the learning process.
  - Goals of the learning process.
  - Construction of knowledge.
  - Strategic thinking.
  - Thinking about thinking.
  - Context of learning.

- **Motivational and Affective Factors**
  - Motivational and emotional influences on learning.
  - Intrinsic motivation to learn.
  - Effects of motivation on effort.

- **Developmental and Social Factors**
  - Developmental influences on learning.
  - Social influences on learning.

- **Individual Differences Factors**
  - Individual differences in learning.
  - Learning and diversity.
  - Standards and assessment.
knowledge of how people learn
knowledge of how people learn

- lecture based
- skills based
- technology enhanced
- individual vs. group
- inquiry based
Students come to classrooms with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught or the may learn them for the purposes of a test but revert to their preconceptions outside the classroom.
How People Learn - Key Findings

• To develop competence in an area of inquiry, students must: (a) have a deep foundation of factual knowledge, (b) understand facts and ideas in the context of a conceptual framework, and (c) organize knowledge in ways that facilitate retrieval and application.
How People Learn - Key Findings

• A “metacognitive” approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring progress in achieving them.
Encouraging deeper learning in technology enhanced classrooms

- Help students construct and organize their knowledge
- Illustrate multiple contexts in which knowledge can be applied
- Perform continuous formative assessment during the course of instruction
- Help students develop metacognitive strategies so they monitor their own learning
- Teach interactively!
Making Classrooms Learner-Centered

- Learners use current knowledge to construct new knowledge
- Effective instruction takes into account what students bring to the classroom
- Active engagement in learning supports the construction of knowledge
Making Classrooms Learner-Centered

- Learners should be assisted in developing metacognitive strategies
- “Metacognition refers to people’s abilities to predict their performances on various tasks... and to monitor their current levels of mastery and understanding.” (HPL pg. 12)
- Transfer of learning can be improved when students are aware of themselves as learners and monitor their learning and performance strategies
Making Classrooms Learner-Centered

- Students need opportunities to practice skilled problem solving
- Students need feedback to monitor progress & support to ensure progress
Making Classrooms Knowledge-Centered

• Students are not blank slates; teach based on students’ current knowledge and skills
• Instruction should help students organize knowledge for efficient recall and application in solving problems
• Aim instruction for deep understanding of major concepts and principles rather than acquisition of facts and skills
Deciding what’s important

Assessment

Design Principles

Learning Activities

Lay of the Land

Institutional Context

Learning Principles
Learning Principle: Learning is social

• Learning that is social requires feedback and interaction among participants. A learning space should enable learners to:
  • Get to know each other and engage in dialogue
  • Work on group projects
  • Interact in a variety of ways such as collaborative or cooperative learning
  • Present their work publicly, teach others, or give feedback
What learning activities support our learning principles?

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What learning activities support our learning principles?

- Case studies
- Authentic learning
- Problem-based learning
- Study-teams
- Collaborative projects
- Visualization
- Simulation
What learning activities support our learning principles?

- Do the activities support the learning principles we’ve identified?
- Do the activities support the needs of the discipline?
- Do the activities support our students’ needs?
ACTIVITY I
Building a Common Language

Assessment

Design Principles

Learning Activities

Lay of the Land

Institutional Context

Learning Principles
Design Principles

- Allow you to facilitate learning principles and activities
- Describe what (most) teachers and students should be able to do; ideally their **activities**
Developing A Design Principle

Learning Principle
• Students will be able to present their work publicly, teach others, or give feedback
Developing A Design Principle

Learning Principle
• Students will be able to present their work publicly, teach others, or give feedback

What does the space need to do to accomplish this?
Developing A Design Principle

Learning Principle
• Students will be able to present their work publicly, teach others, or give feedback

Design Principle
• The space will allow the teacher and students to:
  • display multiple types of resources simultaneously;
  • do it easily, simply, and with continuity across spaces without being tied to a physical location;
  • and provide distributed control of presentations
The Final Step

Design Principle
• The space will allow the teacher and students to:
  • display multiple types of resources simultaneously;
  • do it easily, simply, and with continuity across spaces without being tied to a physical location;
  • and provide distributed control of presentations

Room Description
• Five of fifteen classrooms will have:
  • Four display screens with video projectors
  • Visual presenter
  • VCR
  • DVD
  • Wireless overlay
  • 20 Table PCs
  • Wireless connectivity to the internet
  • Wireless connectivity to the presentation system
  • Power outlets in the walls and floors
  • Productivity software
  • Shared presentation software
MIT’s Design Principles

• Design for people not ephemeral technologies
  • Transparency, natural light, operable windows
• Enable technologies brought to spaces rather than provide technologies for spaces
• Space cycles prevail over machine cycles
• Spaces vary from hard to soft - emphasize soft spaces
• Design for a 24 hour day
• Spaces should be “zoned” for sound/activity -
  • quiet/noisy;
  • High/low turnover;
• Adaptability over fixed
Informal Spaces

- Comfortable furniture, setup
- Variety
- Aesthetics
- Appropriate furnishings and hardware
- Connections between space, people, hardware, resources and ideas
- Zones
- Food
- A Centre for the Community
ACTIVITY II
Knowing you have it right

Assessment

Design Principles

Lay of the Land

Institutional Context

Learning Activities

Learning Principles
What are our critical success factors?

- What are the hurdles ahead of us?
- What do we have to do to get over them?
How do we know if we are successful?
Now you can start to design
Explore - Look at other facilities
Mock Up: explore ideas and test assumptions
Model your ideas
ACTIVITY III
Let's look at some formal and informal spaces
Formal Spaces

As you look at the following spaces, please note:

• The characteristics of the space
• The learning activities the space would support
• What it would take to support the space
Informal Spaces
Do we have the right people at the table?
Who do you need in your design community?

- Developing design principles is a community process
- A variety of different skills are needed
- Who would you include?
Key Learnings

• Make sure people understand the vision and design principles and can articulate them to others
• Be aware of the potential impact on the rest of campus - who and what
• As much as you can, keep everyone involved throughout the entire process, especially your allies and vision keepers
Key questions

• What is the impact on the rest of campus?
• Who (what organizations) will be impacted?
• Is what you’re planning scalable?
• Who do you need to communicate with?
• Are they willing to discuss the hard questions?
• EDUCAUSE Learning Initiative - Learning Space Design
  http://www.educause.edu/LearningSpace/5521

• Constituent Group on Learning Space Design
  http://www.educause.edu/Community/ConstituentandDiscussionGroups/5983

• Society for College and University Planning
  http://www.scup.org

• Design Share - The International Forum for Innovative Schools
  http://www.designshare.com/