Just Do It: Prototyping Toward Progressive Renovation of Learning Spaces

Prof. Phillip D. Long
Director
Where I hope we’ll go today...

Teaching to learning
learning & spaces
a palette of spaces
more than boxes
a culture of inquiry
The Shift from teaching to learning
(Barr & Tagg, 1995)

Instructional paradigm to the learning paradigm.

Begin with what we want students to be able to do at the end
and design to get there.

http://critical.tamucc.edu/~blalock/readings/tch2learn.htm
The Problem of Learning

How do we make formal learning environments more like practice-based learning environments?
Is Learning really influenced by the environment?

Detailed lists

Abstract ideas

Low ceiling

High ceiling
What do the spaces use for teaching say about learning?

If these walls could talk...

Prof. Michael Wesch &
the students of
Cultural
Anthropology 101
Kansas State Univ.

“A Vision of Students Today” - http://www.youtube.com/watch?v=dGCJ4ovyRgo
Pause
Learning environments

A palette of spaces

- the Personal Lab
- Minimalist
- Active Learning
- Specialised Spaces
- Virtual SpacesLab
- PerformanceNon-formal
- sanctuaryLab spaces
- Group Study
- prototyping
a laptop tool kit (multimeter, dial calliper, wire strippers, etc.)
software - Mathcad, Solidworks, MS Office
Robot kit (Boe-bot)
http://www.parallax.com
Minimalist Spaces

© InQbate: The CETL in Creativity
Minimalist Spaces

floor to ceiling whiteboard walls

Georgia Tech University
Active Learning - group collaboration

Team screens

Messaging intent

PC per table

University of Birmingham, UK
Active Learning - Scale-up/TEAL

Engineering

Task lighting

Screen per team

Whiteboard ribbon

3 PCs per table

Tables of 9

Teams of 3

University of Queensland
Specialised Group Spaces

Terraces
Teams
Orientation

University of Birmingham, UK
Specialised Group Spaces

- Observation cameras
- Whiteboard per team
- Screen per group
- Flexible Fume hood
- “Pac Man” orienting tables

University of Birmingham, UK
Virtual spaces

QWAK @ Duke Uni.

Bettina Scheucher
Virtual spaces

MasterClass in Piano between Yale University & the University of Queensland
Sanctuary Outdoor Spaces
Sanctuary Spaces
Laboratory Spaces

Biosciences Lab
(wet lab)
Laboratory Spaces

Engineering Lab

“Inegrated Learning Lab”
Performance Spaces

Kresge Auditorium, MIT
Performance Spaces
Non-Formal Learning Spaces

- Shared Screen
- Movable Chairs
Non-Formal Learning Spaces

Ad hoc study rms

“Club style” study spaces

USC
Group study spaces
Group study spaces
Prototyping Spaces
Learning spaces also have a temporal dimension.
Learning spaces, when well designed, serve the academic enterprise
But learning Spaces need to be re-thought in terms of their use across a 24 hour day.
Built environments as a learning back channel

Listening to the physical world
Live Environments 1.0

Queen’s University Live Building from “push”...

Getting data

Interpolated data. Advanced statistical analysis is also available. There are 6000 data points in total, so not all of them are available here; if you would like something included that isn’t listed, please contact us. Alternatively, you can download a more advanced graphing and analysis tool from the sidebar (within Queen’s Campus only).

Timing & Statistical Analysis

Original Values
Interpolated Values
- Average
- Std Dev
- Minimum
- Maximum
- Mean (event-weighted)

RESULTS

Values will need to be saved in a text file with the extension .CSV. Then they can be opened in any program. If a timeout occurs, try reducing the date range or increasing the interval.

Copy values to clipboard
Live Environments 2.0

To “Pull”

- subscribing to data for personal devices
The Transition to Software Infrastructure
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Routing presentation video by hardware switches vs. software
Relative rates of obsolescence
Finding a Common Language

Relative focus on the issues of technology and AV in learning spaces
Pause
Building a Culture of Active Inquiry

Built on passion in spaces that inspire it. Where recreation becomes an act of re-creation & remix through engaged learning (JSB)
Re-Thinking Process

- Learning Modes
- Needs, Goals, Vision
- Literature Scholarship
- Personas
- Journey Maps
- Service Blueprints
- Bench-marking
- Requirements

The Service Designed Environment
- Activities & Interactions
- Support
- Iterative Assessment

Elliot Felix, http://www.brightspotstrategy.com
Learning Activities

Class Lab Mode
- Occasional use
- Week duration
- Storable

Independent Study
- Desktop project
- 1 to 2 terms
- Student developed

Research Design Support Mode
- In and out capability
- Temporary design space use by team
- Weeks to months

Design Project Mode
- Large scale project
- Term length
- Virtual design
- Dedicated space
- Breakout / report-back space

Tinkering Mode
- Occasional
- Temporary work space

Outreach Mode
- Weekly
- Accommodate visits, lectures, presentations

Teaching in Labs
- Occasional
- Presentation area
- Demonstrations

Large Class Project Mode
- Year scale
- Design intensive
- Dedicated space
- Product thrust
- Close connectivity to outside

Thesis Mode
- 1+ years
- Equipment needs
- Dedicated space
- In and out capability

Linked Projects Mode
- Connectivity (multidisciplinary)
- Best or less
- Multi use lab experiments
- Boat lab/ design

External Partnership Mode
- Coursing
- Win-out outsourcing
- Graduate
- Dedicated space

12 of 21 Modes

Courtesy of Ed Crawley, MIT
# Learning Activities

## Key structure:

**Learning Activity Type**
- **metadata descriptors**
  - timing (when)
  - frequency
  - temporal pattern
  - duration
  - storage
  - periodicity
  - connectivity
  - collaboration
  - number of students
  - size of activity space
  - access
  - special infrastructure (gases, water, etc.)

## Table of Learning Activities

<table>
<thead>
<tr>
<th>No</th>
<th>Operational Mode</th>
<th>Revised Mission Relevance Score</th>
<th>Revised Mission Relevance Ranking</th>
<th>Mission Relevance Score</th>
<th>Mission Relevance Ranking</th>
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<td>Large Systems Mode (1M, ENG, LM, SDM)</td>
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<td>Distance Learning/Teaching Mode</td>
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## Diagram

The diagram illustrates the key structure of learning activities, including metadata descriptors such as timing, frequency, temporal pattern, duration, storage, periodicity, connectivity, collaboration, number of students, size of activity space, access, and special infrastructure (gases, water, etc.).
Nouns of Learning Spaces

Work surfaces -- Smartboards, whiteboards, tack boards, flip charts, blackboards
Display outputs -- Flat panels, projectors, optiputers
Mobile devices -- Tablet PCs, smartphones, laptops, iPods
Audio channels -- Microphone, outputs
Artifacts -- Inspirational objects, displays, posters
Furnishings -- Tables, chairs, couches, partitions
Capture / Re-use systems -- Lecture capture, LMS, personal podcasts, web
Architectural elements -- Finishes, carpeting, room geometry, lighting configuration
Connecting socially -- Peer-to-peer, faculty-to-student Discussing / Arguing -- Dyads, small group, "in the round" Commenting -- Anchored discussion, annotation from multiple sources Demonstrating Presenting / Demonstrating Searching -- ad hoc, across resources Capturing -- Faculty, student, group work (long-term, e-folios) Thinking/conceiving Debating/negotiating space
Prototyping & Tinkering

We know the entire campus is a learning environment, across space & time.

Graphic: Shirley Dugdale, DEGW
If buildings are ‘built pedagogy’, and inquiry & discovery are fundamental components of learning, how are these elements represented in the way we plan and make available spaces for learning on our campuses?
Thank You

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&
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