when space becomes more than a place….
panel

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today

place
“cutting edge” to expected
learners and learning
current opportunities
involved upfront
flexibility
resources
— Roget’s 21st Century Thesaurus: Concepts #435

“...ASYLUM .......barrier .......dynasty .......
haunt ......depository ....depot”
‘place’ becomes ‘places’

expanding awareness from formal spaces:

- lecture halls
- classrooms
- teaching labs
- case study rooms
- seminar rooms
‘place’ becomes ‘places’

to commons

corridors and lobbies
cafés
stairs
grass and grads
lounges
group study
‘cutting edge’ to expected

going quickly from ‘cutting edge’ to ‘state of the art’ to ‘state of the state’
‘cutting edge’ to expected

examples

Emory University – Cox Hall Computing Center
‘cutting edge’ to expected examples
MIT aero lab
‘cutting edge’ to expected examples

NCSU Phase II & Phase III
‘cutting edge’ to expected examples
Central Michigan Health Professions
‘cutting edge’ to expected

ELI Focus Sessions

2004  design of formal learning spaces (MIT)

2005  design of informal learning spaces (Estrella Mt.)

2006  design of virtual learning spaces (U of Md)
‘cutting edge’ to expected

‘new’ trends from ELI (Sept. 05) by Phil Long (MIT) and Malcolm Brown (Dartmouth)

- intentional support for social learning strategies, informed by principles
- return to human centered design
- support of diverse, personally-owned devices to enrich academic learning
learners and learning
learners

the ‘net ‘generation’
multi-tasked
experienced – learn by doing
collaborative
digital
portable
connected
fluid
immediate
net gen learning preferences

- peer-to-peer
- engagement & experience
- visual & kinesthetic
- things that matter
life interruptions

limited time

work responsibilities
job shift

transportation problems

family responsibilities

health issues

financial challenges

(Bleed, 2005)
Diana Oblinger, ELI ‘05 Arizona
Students who were very satisfied with Web-based learning by generation

Age vs. learning preferences

- Mature: 63%
- Boomers: 55%
- Gen X: 38%
- Net Gen: 26% (Dziuban, 2004)
90% Immediate Application
75% Practice by doing
50% Discussion Group
30% Demonstration
20% Audiovisual
10% Reading
5% Lecture

1 Average retention rates of learning activities. 
Source: National Training Laboratory, Bethel, ME
challenges / opportunities
current opportunity

Higher Education Spending

2005 $16.25 Billion – 65 Million Square Feet
2006 $17.25 Billion – 69 Million Square Feet
2007 $18.5 Billion – 74 Million Square Feet
2008 $18.5 Billion – 74 Million Square Feet
2009 $18 Billion – 72 Million Square Feet
2010 $17 Billion – 68 Million Square Feet
current opportunity

increased expenditures on buildings
increased donor interest
increased competition for students
increased competition for federal grants
increased recognition of colleges and universities as economic drivers

leading to record expenditure on construction -- opportunity time!
involved upfront
involved upfront

permanent 3-D implications in space
involved upfront

area per person (standards / typicals)

# ....lecture / tablet arm 10-12 nsf
# ....classroom / table-chair 20-30 nsf
# ....seminar 20-25 nsf
# ....computer lab/classroom 30-40 nsf
involved upfront

<table>
<thead>
<tr>
<th>Type</th>
<th>Area (nsf)</th>
</tr>
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<tbody>
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</tr>
<tr>
<td>computer lab/classroom</td>
<td>30-40</td>
</tr>
<tr>
<td>studio/multi-media classroom</td>
<td>40-70</td>
</tr>
<tr>
<td>interactive learning classroom</td>
<td>45-100+</td>
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</tbody>
</table>
involved upfront

what does the facility require?

- classrooms can need 15 sf/person or 45 sf/person – depending on teaching requirements

$250 \times 15 \text{ sf} \times 600 \text{ seats} = $2.25 \text{ million}
$250 \times 45 \text{ sf} \times 600 \text{ seats} = $6.75 \text{ million}

- flexibility = space and dollars
- where is the biggest impact (wanted/needed) – and what can make do with less?
involved upfront

the reality of construction costs

- Research Labs = $350 – 500 per Square Foot
- Libraries = $280 – 350 per Square Foot
- Recreation Centers = $250 – 320 per Square Foot
- Student Housing = $160 – 230 per Square Foot
- Business Schools = $280 – 360 per Square Foot
- Liberal Arts Classrooms = $220 – 300 per Square Foot

$250/Square Foot x 100,000 Square Feet = $25 Million!
involved upfront

“wire strategy”
involved upfront

“wire strategy”
involved upfront

prototyping / labs

iStanford

lecture A

teaming

case study

lecture B

VECTA
involved upfront

budget and assumed sources

- in construction budget?
- in soft project costs?
- in departmental budget?
- in special program budget/grant?
- in college/university budget?
- in separate installation budget?

$5 – 15 per square foot
flexibility
flexibility

lifetime of building components

- Software systems
- Computer, Communications IT Hardware
- Cabling, Systems
- Furniture Systems
- Mechanical/Electrical Systems
- Building Structures*

* Effectively indefinite
flexibility

sources of flexibility

- building
- IT/AV
- furniture / equipment
flexibility – building

means of physical building flexibility

- flat slabs for floors
- floor to floor height
- lighting – natural and…
- mechanical/electrical systems
- IT infrastructure routes
flexibility – building

flat slab

Tiers

Slab

Core Drilling
flexibility - building

floor height

ACTIVITY

Bottom of Slab
Infrastructure / Structure

Infrastructure / Structure
Top of Slab

12' - 16'
flexibility – mechanical / electrical systems

heat and cooling – large group vs. small group load on space
  - capacity – flexibility vs. economy
  - zones for capacity and variable load
power – location flexibility vs. room layout options, capacity
light – dimming control, natural vs. artificial controls – heating/lighting
access to allow change later
flexibility – IT infrastructure / AV systems

(in order of priority during design)

infrastructure routes
size – capacity – logical routing – ‘front’?
top and / or bottom fed?
teaching position / ‘podium’
consistent controls room to room to minimize faculty training
flexibility – AV / IT

real-world nsf per person ratios
floor-to-floor heights based on image size
real-world budgets
schematic design – case study

40 seat computer science classroom
SXGA resolution
11 pt. font
farthest viewer 30’
3.5h screen factor
8.5’h screen
12’ ceiling
schematic design – case study

70 seat computer science classroom
SXGA resolution
11 pt. font
farthest viewer 42’
3.5h screen factor
12’h screen
12’ ceiling, oops!
schematic design - case study

- rotate room 90 degrees
- bring farthest viewer closer
- pop-up the ceiling in the center
- maintain screen size to farthest viewer ratio
schematic design

student workspace planning

3'-0"

2'-0"

3'-6"

1'-6"
flexibility – furniture

Vecta
resources

who to involve
developing goals
analyzing existing facilities
projecting future needs and learning from others
conducting a reality check
exploring alternatives
evaluating and recommending
designing the future

“Educause Review”  July/ August ’05,  Wedge & Kearns p32-38
resources

SCALE-UP

Student Centered Activities For Large Enrollment Undergraduate Programs

North Carolina State University

http://scaleup.programmedbydesign.com
Emory University – Cox Hall Computing Center

http://cet.emory.edu/cox