Seminar 01A – Bigger Can Be Better: Designing Large Classrooms to Support Active Learning

Adam Finkelstein
Laura Winer

Teaching and Learning Services
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Agenda

• Introductions
• What are the affordances needed to support active learning in large environments?
• What are the challenges of teaching in a large classroom?

BREAK

• Analyze examples of large environments
• Select what works best for your campus and discuss with colleagues
Introductions

1. Write down your biggest burning question that you have about this session/topic.

2. Meet your table:
   – Who are you? What is your role at your institution? Why are you in this session?

3. Share your burning question. Discuss and select 1-2 burning question from your table and post on the Poll.
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McGill Context

- 35,000 students from 120 different countries
- 1700 tenure track faculty
- 3400 admin and support
- 475 classrooms / 21,200 seats

- 190 yr-old Heritage campus
- Accumulated deferred maintenance of $900M
Stewardship of Teaching and Learning Spaces at McGill (‘06)

Teaching and Learning Spaces Working Group
University Teaching Labs Working Group

Mandate

- A vision for teaching and learning space development
- Standards based on sound pedagogical and technical principles.
- Steward funding for classroom and lab renovations, IT & equipment

Representation

- All Faculties, relevant service units, students: 40+ stakeholders
- Co-Chaired by Academics and Operations
http://www.mcgill.ca/tls/spaces/tlswg/principles

A PRINCIPLED APPROACH TO LEARNING SPACE DESIGN
Where we began: Thinking about how students learn

1. Active engagement with content and others is required to achieve deep learning

2. Interaction between students and instructors is a critical part of effective learning

(Carini, Kuh & Klein, 2006; Driscoll, 2005; Entwistle, 2010; Pascarella and Terenzini, 2005; Trigwell, Prosser & Waterhouse, 1999; Vygotsky, 1978)
“The one who does the work, does the learning.”

(Doyle, 2008)

Image source: https://flic.kr/p/mwxsysz
Research-informed classroom design

NSSE Benchmarks → Principles for teaching and learning space design → Design features in classrooms
Principles for Designing Teaching and Learning Spaces

1. **Academic challenge**
   Learning spaces should be sufficiently varied for both individual and collaborative work, and include a range of technologies that support multiple modes of teaching and learning.

2. **Learning with peers**
   ... should provide features that allow students to actively engage with content and to collaborate with one another, with or without the support of technology.

3. **Experiences with faculty**
   ... should reduce physical distance and barriers, and facilitate exchanges between students and faculty in the classroom.

4. **Campus environment**
   ... should conform to university design standards, designed with future flexibility in mind and consistent with the university’s culture and priorities as reflected in the campus master plan.

5. **High Impact Practices**
   The campus is a pedagogical space where high-impact practices can be supported and grounded in credited experiences in the classroom / teaching lab.

<table>
<thead>
<tr>
<th>Principle</th>
<th>Layout</th>
<th>Furniture</th>
<th>Technologies</th>
<th>Acoustics</th>
<th>Lighting &amp; Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Challenge</td>
<td>[Promoting active engagement with content]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning w/ Peers</td>
<td>[Promoting active engagement with one another]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiences with Faculty</td>
<td>[Promoting interaction and communication]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campus Environment</td>
<td>Standards applied; flexible for future use; meet the needs for all; designed to integrate with surroundings; coherent with the master plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Impact Practices</td>
<td>Ensure ubiquitous availability of, and support for, all affordances (physical, virtual) to maximize HIPs for student learning</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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<tr>
<td><strong>Academic Challenge</strong></td>
<td>- Work surfaces for notebooks, laptops, textbooks</td>
<td>- Comfortable furniture;</td>
<td>- Access to infrastructure</td>
<td>- Acoustic design to avoid distraction from outside and inside sources</td>
<td>- Appropriate lighting for individual work</td>
</tr>
<tr>
<td>[Promoting active engagement with content]</td>
<td></td>
<td>- Varied furniture to support different types of tasks and preferences</td>
<td>- Access to resources</td>
<td></td>
<td>- Intentional use of colour to promote focus</td>
</tr>
<tr>
<td><strong>Learning w/ Peers</strong></td>
<td>- Promote F2F communication</td>
<td>- Flexible seating</td>
<td>- Shared workspaces</td>
<td>- Sound zones support simultaneous conversations</td>
<td>- Different lighting patterns to support different activities</td>
</tr>
<tr>
<td>[Promoting active engagement with one another]</td>
<td>- Individuals can move about easily</td>
<td>- Intentional use of furniture of different heights and shapes</td>
<td></td>
<td>- Appropriate amplification</td>
<td>- Using colour to define groups’ use of space</td>
</tr>
<tr>
<td><strong>Experiences with Faculty</strong></td>
<td>- Easy access to all students</td>
<td>- Podium doesn’t interfere with sightlines, movement and interaction</td>
<td>- Screen sharing</td>
<td>- Sound zones support multiple simultaneous conversations</td>
<td>- Different lighting patterns to support multiple types of teaching tasks</td>
</tr>
<tr>
<td>[Promoting interaction and comm.]</td>
<td></td>
<td>- Flexible furniture to support different teaching strategies</td>
<td>- Ability to control classroom technologies away from the podium</td>
<td>- Appropriate amplification available</td>
<td>- Colours distinguish purposes</td>
</tr>
</tbody>
</table>
Activity: Key affordances to support active learning?

• Think of active learning strategies you would like to encourage
• Think about what the most desirable affordances to support active learning
• Share with table

• Post top 3 affordances desired to poll
Your poll will show here

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What is a large classroom?
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What are the challenges of teaching in large classrooms?

• At your table, brainstorm a list of challenges

• At your table, identify the 3 most important challenges
Your poll will show here

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BREAK
ACTIVE LEARNING IN LARGE CLASSROOMS
Approaches to active learning in large classrooms

1. Be collaborative in existing large classrooms
2. Modify large classrooms to better support collaboration
3. Significantly rethink large classroom design
4. Create large Active Learning Classrooms
1. BE COLLABORATIVE IN EXISTING LARGE CLASSROOMS
Natural Disasters Course

• Science of disasters and (in)ability to predict/control these events
• No prerequisites
• Open to all students
• Offered since 2000
Natural Disasters Course

• Lecture based
• Enrolments at 600+
• Meets in largest lecture hall on campus
• Midterm, Final Paper, Final exam (no MCQ)
• Popular course, very positive evaluations
2011 Tohoku Tsunami

- Waves approximately began at 1.5km, increasing in amplitude. The water contains debris, including boats, sheds, and seaweed. A wave is seen in the distance.
- No drought or flooding.
- Run-up wave factors: The coastline and road appear to be damaged by waves.

- Large quantities of water are accumulating as the waves increase in amplitude.
- Waves are not breaking but come in as a flood. This means that the top of each wave does not exceed 1/7 of the wavelengths.
- Impact: Tsunamis caused significant destruction, vehicles and boats are lost, houses and streets are flooded, and serious damage is caused to houses.

- Tsunamis hit Japan and caused significant destruction, including the 2011 Tohoku earthquake and tsunami.
The Aftermath of the Kihei Maui Tsunami Wave

Objective: To study the effects of a tsunami wave on the beach and marine life.

Methodology:
- Set up a camera at a fixed distance from the beach to capture the wave's movement.
- Use a depth meter to measure the depth of the water at various points along the beach.
- Collect samples of marine life before and after the wave to observe changes.

Results:
- The wave was recorded as reaching a height of 3 meters.
- The depth of the water varied from 2 to 3 meters.
- Marine life was displaced, with some species moving further inland.

Conclusion:
- The wave caused significant displacement of marine life and change in water depth.
- Further research is needed to understand the long-term effects on the ecosystem.

<table>
<thead>
<tr>
<th>Wave Characteristics</th>
<th>Before Tsunami Wave</th>
<th>After Tsunami Wave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>2 meters</td>
<td>3 meters</td>
</tr>
<tr>
<td>Water Depth</td>
<td>2 meters</td>
<td>3 meters</td>
</tr>
<tr>
<td>Marine Life</td>
<td>Displaced</td>
<td>Displaced</td>
</tr>
</tbody>
</table>

*Note: The above table is a fictional representation for the purpose of this exercise.*
More strategies to increase engagement in large classes
2. MODIFY LARGE CLASSROOMS TO BETTER SUPPORT COLLABORATION
McGill University – Leacock 219

184 seats – no arm seating, large writing surface, multi screen multi source AV
McGill University – Leacock 219
Iowa State – LeBaron Hall Auditorium
363 seats
Iowa State – LeBaron Hall Auditorium

363 seats – swivel seating on tier
McGill University – Arts W120

104 seats – two rows tier, fixed table, movable chairs, writable walls, multi screen multi source, videoconferencing, wireless screen sharing, student microphones
McGill University – Arts W120

104 seats – writable surfaces
McGill University – Arts W120

104 seats – natural light, mural scenes
3. SIGNIFICANTLY RETHINK LARGE CLASSROOM DESIGN
University of Windsor School of Engineering

350 students
University of Windsor School of Engineering
350 students
University of Windsor School of Engineering
350 students
University of Windsor School of Engineering

350 students
McGill University – Education 129

104 seats
McGill University – Education 129

104 seats
McGill University – Education 129

104 seats
Learning Innovation Center – Oregon State U

600 seat arena classroom
Learning Innovation Center – Oregon State U

600 seat arena classroom
4. CREATE LARGE ACTIVE LEARNING CLASSROOMS
Active Learning Classroom – 80 seats – 2010

Fixed Y-tables, counter height, movable chairs, writable walls, multi-sources, screen sharing, raised floor
Hicks Learning Studio – Purdue University

117 seats
Bruininks Hall – University of Minnesota
126 seats
4 corners

• What are the advantages and challenges for each approach?

  • http://padlet.com/adamfdotnet/large_existing
  • http://padlet.com/adamfdotnet/large_modify
  • http://padlet.com/adamfdotnet/large_rethink
  • http://padlet.com/adamfdotnet/large_alcs
Summary discussion

• At your table:
  – On your campus, where would you start and why?

• Popcorn plenary:
  – Bring ideas to the plenary
Other sessions of interest

• Learning Space Design Discussion Session
  – Thurs 9:10 – 10:00 – Meeting room 132-133

• Kicking the Tires on the Learning Space Rating System
  – Fri 8:00 – 8:50 – Wabash Ballroom 2
Thank you!

• Evaluations online or in app
• Contact us:
  – http://www.mcgill.ca/tls/
  – http://teachingblog.mcgill.ca/
  – @McGillTLS / tls@mcgill.ca

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