Collaborative Space: How Can Our Physical Environment Promote Scientific Breakthroughs & Improve Learning Outcomes?
1. Why Collaborate?
2. Enhancing Collaboration
3. Case Studies
4. Survey Results & Implications
Why Collaborate?
New Learning for Gens Y, Z, ?...
- ‘Next-Genning’ the infrastructure
- Immersive Learning: “Leaving the Flat Land”
- Includes students AND new faculty!

Advances in science and technology
- Rapidly expanding knowledge base
- Integration & Innovation
- Overwhelming amounts of information available
  - Students and Faculty!

Advances in learning theory
- Learning within context
- Experiential learning
- Problem-focused
The Science of Learning: 7 Principles

1. Learning with understanding is... **structured around the concepts.**

2. Learners use what they **already know**

3. Learning is facilitated through **continual assessment**

4. Learners have different **learning styles**

5. Learners’ **confidence and motivation** impacts effectiveness, efficiency and effort invested in learning

6. The **practices and activities** engaged in while learning shape what is learned

7. Learning is enhanced through **socially supported interactions**

Three of the four activities identified in the knowledge transfer cycle involve **collaboration**...which, in the highest performing organizations, represents over 50% of the work day.
Places of Invention & Innovation

Common Features*:

- Flexibility
- Leadership (clear mission) with a “soft touch”
- Encourage contact between people
- Balance inclusion & seclusion

Other implications*:

- Freedom in work style and personal control of space matter - an element of chaos
- “Communities” play an important role in shaping places of invention
- “Flow” is an important part of the innovation process and can be reflected in the physical environment (flexibly, of course!)
- Planning creative spaces works best in stages with evaluation and adjustment along the way swing space offers good opportunity

*From research conducted by the Lemelson Center for the Study of Invention & Innovation @ the Smithsonian Institute
Why Collaborate?

- Generational styles & preferences
- Improved teaching outcomes
- Model team-based work environment
- Promote innovation
How do I encourage collaboration?
Density & Buzz

**Lab Building:**
650 GSF (360 NSF) per person
55% efficient

**Office Building:**
250 GSF (150 NSF) per person
60% efficient

**Classroom:**
100 GSF (65 NSF) per person
65% efficient

*Gross square feet (GSF) is the total building area, net square feet (NSF) equals the usable program space within the building.*
Comparative Analysis: Capacity

1 collab. st : 3-6 inst. sts
1 collab st. : 8-12 inst. sts

Professional School Academic/Research Building

Undergraduate Science Teaching Building
Types of Collaborative Seating

STUDY

BREAKOUT

SOCIAL
How do I encourage collaboration?

- Maximize building density
  - Aim for high utilization
  - Provide human “magnets”

- Provide specific places for various kinds of interaction
So how is collaborative space being addressed elsewhere?
Case Study Comparison

Emory University School of Medicine
- Teaching & Office
  - 150,000 GSF
  - Completion: 2008
  - Current Enrollment: 550
  - Projected Enrollment: 600

University of GA School of Pharmacy
- Teaching, Office & Research (40%)
  - 184,000 GSF
  - Completion: 2009
  - Current Enrollment: 570
  - Projected Enrollment: 800

Emory University School of Public Health
- Teaching, Office & Research (50%)
  - 190,000 GSF new construction/
    146,000 GSF existing
  - Completion: 2010
  - Projected Enrollment: 1,200
Emory University
School of Medicine

- Create a “home” for med students
- Integrate new and existing into a single complex
- Incorporate new teaching modalities/technologies and curriculum
- Increase class size
Emory University SoM

Projected Enrollment:
- Medicine: 600

Formal Instructional: 1,305 seats
Informal Instruction: 264 seats

Study Space
- 115 seats
- 4,600 NSF

Break Out Space
- 49 seats
- 3,500 NSF

Social Space
- 100 seats
- 4,000 NSF

- instructional space
- study space
- break-out space
- social space
- office space
- research space

12,242
14%

27,622
33%

45,226
53%
University of Georgia
College of Pharmacy

• Integrate new and existing into a single complex
• Significant enrollment increase
• Address curriculum redesign
Projected Enrollment:
- Pharmacy: 800

Formal Instructional: 857 seats
Informal Instruction: 153 seats
Emory University
Rollins School of Public Health

• To rise in the rankings of schools of Public Health
• Grow graduate student enrollment
• Break down departmental silos by developing theme-based research environments
• Integrate new and existing into a single complex
Projected Enrollment:
• Public Health: 1,200

Formal Instructional: 797 seats
Informal Instruction: 480 seats
Comparison: Current Collaborative Distribution

Emory RSPH
- Planned Enrollment: 1,200
- Study Space: 5,600 NSF (33%)
- Break Out Space: 4,800 NSF (33%)
- Social Space: 7,500 NSF (34%)

Emory SoM
- Planned Enrollment: 600
- Study Space: 4,600 NSF (38%)
- Break Out Space: 3,500 NSF (19%)
- Social Space: 4,000 NSF (43%)

UGA Pharmacy
- Planned Enrollment: 800
- Study Space: 4,300 NSF (52%)
- Break Out Space: 3,800 NSF (34%)
- Social Space: 770 NSF (16%)

Total:
- Emory RSPH: 17,890 NSF
- Emory SoM: 12,200 NSF
- UGA Pharmacy: 9,000 NSF
But what types of collaborative space will people actually use?
In what spaces do you engage with other Pharmacy classes (graduating years)? (student responses)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Yes</th>
<th>Sometimes</th>
<th>Never</th>
<th>Response Count</th>
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<td>Auditoria</td>
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<td>Pharmacy Care Center</td>
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<td>Discussion Rooms</td>
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<td>Kroger Learning Center</td>
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<td>Lobby</td>
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<td>6</td>
<td>98</td>
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<tr>
<td>Informal Seats in circulation</td>
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<td>37</td>
<td>15</td>
<td>100</td>
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<tr>
<td>Student Lounge</td>
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<td>28</td>
<td>97</td>
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<td>Outside Plaza</td>
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<td>100</td>
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<td>Research Team Areas</td>
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<td>Research Labs</td>
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<td>7</td>
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<td>97</td>
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<tr>
<td>Conference Rooms</td>
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<td>43</td>
<td>41</td>
<td>98</td>
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<tr>
<td>Faculty / Staff Offices</td>
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<td>27</td>
<td>65</td>
<td>99</td>
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<tr>
<td>Comments</td>
<td></td>
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</table>

answered question: 101  
skipped question: 66

https://www.surveymonkey.com/s/DWK63XP
What Shapes Student Learning at RSPH Emory?

Photovoice

- Method of qualitative data collection in which participants are given a camera and asked to respond to key questions

- Participants identify, enhance and represent elements of their community through photos

- Developed from nexus of:
  - Theoretical literature on education for critical consciousness
  - Feminist theory
  - Documentary photography

- Problem-posing education begins with issues that people see as central to their lives
  - Hence idea to ask participants to record elements of their life/ community
What encourages you to learn?
The new RSPH building was the most commonly represented motivator for learning

- open space
- opportunities for meetings/ group work
New building was seen as promoting learning by providing space for communication, group work, inspiration and access to resources (inc. Professors)
Participants

<table>
<thead>
<tr>
<th>CoP</th>
<th>168</th>
<th>20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoM</td>
<td>244</td>
<td>30%</td>
</tr>
<tr>
<td>SPH</td>
<td>415</td>
<td>50%</td>
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</table>

138 staff, 6 faculty, 3 advanced degree students, 8 1st professional degree students

Total Respondents: 827

Pharmacy:
- 141 students (18%)
- 138 students
- 13 students (30%)
- 6 students
- 3 advanced degree students
- 3 1st professional degree students

Medicine:
- 182 students (30%)
- 176 students
- 31 students
- 6 students
- 3 advanced degree students
- 3 1st professional degree students

Public Health:
- 229 students (19%)
- 221 students
- 59 students
- 8 students
- 8 advanced degree students
- 8 1st professional degree students
Where do faculty / staff engage with other disciplines?

- **37%** of faculty/staff use common spaces for interdisciplinary collaboration.

<table>
<thead>
<tr>
<th>Totals:</th>
<th>total votes</th>
<th>% of votes</th>
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<tbody>
<tr>
<td>study space</td>
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<td>8%</td>
</tr>
<tr>
<td>break out space</td>
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<td>13%</td>
</tr>
<tr>
<td>social space</td>
<td>144</td>
<td>16%</td>
</tr>
<tr>
<td>instructional</td>
<td>321</td>
<td>35%</td>
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<tr>
<td>office</td>
<td>254</td>
<td>28%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>911</strong></td>
<td><strong>-</strong></td>
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</table>

“I would have put one or two "dining spaces" in the entire building as opposed as one per floor....if you wanted people to mingle you should have "forced us" to go from 7 to 5 to warm up food or eat.” – Emory RSPH research staff
Where do students like to study?

What other types of Learning Spaces would you like to see in this building? (% of write-in comments)

- Small, Private Study Rooms (45%)
- Spaces with Comfortable Seating (9%)
- Large study rooms with individual workstations (7%)
- More Computer Areas (7%)

63% of students prefer to study in informal learning spaces

“I like the areas where a small group can meet and study together, with some ability to talk to one another, with tables instead of just couches…” Emory RSPH student
Collaboration/Study Location Preferences

- Students:
  - Collaborative spaces: 63%
  - Classroom: 30%

- Faculty/Staff:
  - Collaborative: 37%
  - Classroom: 35%
Collaboration/Study Space Type Preferences

Students:
- Study space: 60%
- Break-out space: 32%
- Social space: 8%

Faculty/staff:
- Study space: 43%
- Break-out space: 35%
- Social space: 22%
How do Students study?

"I think that it would be great to have tables in a few of the break-out areas instead of those chairs with the little tiny arm tables."
Emory SoM student

"...study alone but in the presence of others..."
Emory RSPH student

Students study...

With Others
144
40%

Alone
213
60%

UGA- 56%
SoM- 53%
RSPH- 63%

Amenities needed to study...

Away from student traffic / quiet, secluded location
288
Power for charging technology devices
263
Comfortable furniture
178
Good lighting
151
Food / beverage service
126
Access to technology
59
Views outside the facility
58
Close to student traffic / student activity
28
### Revised Retention Findings

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
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<tbody>
<tr>
<td>Live lecture of content</td>
<td>138</td>
</tr>
<tr>
<td>Audio / visual aids of content</td>
<td>151</td>
</tr>
<tr>
<td>Observing demonstration of content</td>
<td>159</td>
</tr>
<tr>
<td>Reading content</td>
<td>186</td>
</tr>
<tr>
<td>By teaching others</td>
<td>213</td>
</tr>
<tr>
<td>Practice by doing / experiential learning</td>
<td>304</td>
</tr>
</tbody>
</table>

#### Summary:
- **Live Lecture**: 138
- **A/V Aids**: 151
- **Observing Demo**: 159
- **Reading Content**: 186
- **Teaching Others**: 213
- **Practice by Doing**: 304
Revised Retention Findings

1. Live Lecture
2. Audio/Visual Aids of Content
3. Observing Demonstration of Content
4. Reading Content
5. By Teaching Others
6. Practice By Doing

Revised Retention Findings

138
151
159
186
213
304
Retention Findings

UGA
CoP

Emory
SoM

Emory
RSPH

KEY
Lecture
Reading Content
A/V Aids of Content
Observing Demonstration
Practice by Doing
Teaching Others
Revised Retention Findings

- Live Lecture
- Audio/Visual Aids of Content
- Observing Demonstration of Content
- Reading Content
- Practice By Doing
- Occurs in Collaborative/Study Space
- By Teaching Others
The Right Collaborative Space

1. **Small, private study rooms** where you can work by yourself or with 2 - 4 students

2. **Large, study rooms with individual workstations** so as to be near others while not near high traffic areas

3. **Power-charging spots for technology**

4. **Comfortable, ample worksettings** - a place to spread out a computer, text book, notebook, drink, & cell phone for long periods

5. ‘**Media Gardens**’ that provide Printing facilities, monitors, & scanners for students to access
Comparison: Current Collaborative Distribution

- **Emory RSPH**
  - Planned Enrollment: 1,200
  - Study Space: 5,600 NSF (43%)
  - Break Out Space: 4,800 NSF (39%)
  - Social Space: 7,500 NSF (28%)
  - Total: 17,890 NSF

- **Emory SoM**
  - Planned Enrollment: 600
  - Study Space: 4,600 NSF (77%)
  - Break Out Space: 3,500 NSF (58%)
  - Social Space: 4,000 NSF (67%)
  - Total: 12,200 NSF

- **UGA Pharmacy**
  - Planned Enrollment: 800
  - Study Space: 4,300 NSF (54%)
  - Break Out Space: 3,800 NSF (47%)
  - Social Space: 770 NSF (95%)
  - Total: 9,000 NSF
Conclusions: After Feedback…

- **Emory RSPH**
  - Planned Enrollment: 1,200
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Planned Enrollment:
- Emory RSPH: 1,200
- Emory SoM: 600
- UGA Pharmacy: 800

Seats:
- Emory RSPH: 197 (50%)
- Emory SoM: 67 (30%)
- UGA Pharmacy: 44 (20%)

Planned Enrollment:
- Emory RSPH: 1,200
- Emory SoM: 600
- UGA Pharmacy: 800

Total:
- Emory RSPH: 17,890 NSF
- Emory SoM: 12,200 NSF
- UGA Pharmacy: 9,000 NSF
Conclusions

1. Rethink
   Plan teaching spaces to support informal learning

2. Redistribute
   Utilization & Desirability improved by
   - Location

3. Reallocate
   Utilization & Desirability improved by
   - Flexible space
   - Furniture
Rethink / Redistribute / Reallocate
Open study areas before: soft seating with individual tablet arms
Rethink / Redistribute / Reallocate

Open study area after: traditional tables and chairs on casters
Rethink / Redistribute / Reallocate
Breakout area before: individual soft seating with table arms
Rethink / Redistribute / Reallocate

Breakout area after: work tables and chairs
Rethink / Redistribute / Reallocate

Breakout area after: work tables and chairs
Rethink / Redistribute / Reallocate

Small group room before: individual soft seating with table arms
Rethink / Redistribute / Reallocate

Small group room before: individual soft seating with table arms
Rethink / Redistribute / Reallocate
Small group room after: traditional tables & chairs
Rethink / Redistribute / Reallocate

Quiet reading room before: large area of soft seating
Rethink / Redistribute / Reallocate

Quiet reading room after: additional study tables
Rethink / Redistribute / Reallocate

Requirement for sufficient work surface
Rethink / Redistribute / Reallocate

Student lounge before: sofas & ottomans
Rethink / Redistribute / Reallocate

Student lounge after: additional study tables without computers
Conclusions

The type of space interacts with furnishings. You need to get both correct.

When studying, sufficient work surface is key.

When space and furnishings work together, there is higher usage and greater use of technology.

Students like a variety of work spaces. The mix of space is less important than providing different types of spaces.
Measurable Outcomes

Space:
- Utilization
- Desirability

Faculty:
- Retention
- Productivity

Student:
- Retention
- Performance
Teaching Spaces that Support Collaborative Study

Emory SoM Clinical Skills “Pods”

Duke SoM TBL Lecture Hall

UVA SoM Learning Studio
Conclusions

1. Health science students prefer to “study alone in the presence of others” and value places like resource rooms and libraries for study and group collaboration.

2. Design formal instructional spaces to support informal study in order to improve seat utilization and increase density.

3. Adjust initial distribution targets for collaborative spaces allocation to:
   a) 50% study space (resource rooms, quiet study rooms, etc.)
   b) 30% break-out space (seats along circulation paths, kiosks, etc.)
   c) 20% social space (cafes, student lounges, etc.)