Research Questions & Data Collected

- What variety of teaching practices are currently used in our program?
- What are the relationships between specific classroom practices and student learning?

Goal: identify these relationships to inform teaching practice

Use of class time measured via COPUS profiles

Characterizing Classrooms using COPUS$^{1,2}$:
During a classroom visit, student and instructor activity codes are checked off in 2-min intervals. Each classroom can then be characterized:

- COPUS Profiles N

Data collected

<table>
<thead>
<tr>
<th>Course Level</th>
<th># of Course Sections</th>
<th># of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>7 6 13</td>
<td>10 4 64</td>
</tr>
<tr>
<td>200</td>
<td>7 5 12</td>
<td>14 5 36</td>
</tr>
<tr>
<td>300</td>
<td>2 3 5</td>
<td>3 2 8</td>
</tr>
<tr>
<td>400</td>
<td>2 3 8</td>
<td>3 4 5</td>
</tr>
<tr>
<td>Total</td>
<td>20 15 26</td>
<td>26 10 86</td>
</tr>
</tbody>
</table>

- Each course was observed for a "typical week" (~3 hours)
- 16 diagnostic tests consisting of a total of 242 questions, completed largely from validated questions in the literature.

Classroom Practices & Student Learning

Preliminary Conclusions and Next Steps

- We can now quantitatively link program-wide class observational data with student outcomes.
- Still to analyze: term 2 data

What to make of the inconclusive data? e.g.,

- Instructor Feedback to Class

Student Performance and Classroom Types

- Student Performance here is defined as the Percent Normalized Change on the diagnostic test: (postscore-prescore) / (1-prescore) if post > pre.

Student Performance Positively Correlated with Group Work and Clickers

Questions for you, with this rich dataset:

Research:
- How would you approach your analysis?
- What would you look for? What questions would you ask?

Teaching:
- How might these results impact your own teaching practices?

Conclusions & Next Steps

- Preliminary Conclusions and Next Steps

Examples:

- COPUS Profiles N

Overall Student & Instructor Practices

- As a percentage of activities, students are...
- As a percentage of activities, instructors are...

In our classes, the most common student-centred activities are:
- Worksheets
- Clicker questions
- Individual problem-solving
- Asking/answering questions (talking to class)

Thank you to...
- the many Biology instructors and students participating in this research.
- Leah MacFadyen & the LAVA group for helpful discussion on COPUS analysis.

References