What’s (Really) Happening in My Class?: Visualization of Classroom-Observation Data

Beth Fisher
Director of Academic Services, The Teaching Center
Lecturer in Women, Gender, & Sexuality Studies

Erin Solomon
AAU Project Manager, CIRCLE and The Teaching Center

Supported by the AAU Initiative to Improve STEM Education and the Professional and Organizational Development Network in Higher Education

Co-Authors:
Regina Frey (Chemistry, The Teaching Center, CIRCLE)
Cheryl Cohen (CIRCLE)
Denise Leonard (The Teaching Center)
Jia Luo (Chemistry)
Jacinta Mutambuki (The Teaching Center)
Santhi Pondugula (Medicine)

Collaborators:
WU Faculty, including Mairin Hynes (Physics) and Heather Corcoran (Design)

Additional faculty in Biology, Chemistry, CSE, Economics, EECE, Physics, Political Science, and Psychological and Brain Sciences

The Teaching Center, Washington University in St. Louis
A Road Map for Today’s Talk

- Discuss objectives for creating observation protocol and visual timeline
- Describe Observation Protocol for Active Learning (OPAL) Tool, with sample timeline
- Discuss sample timeline: What is useful for instructors? How can it help foster reflective teaching?
Broader Framework: Reflective Teaching

Documenting instruction (and student interactions) provides data that we can use to

- See our teaching with an analytical eye
- Modify our approaches
- Continually refine those approaches to improve student learning and engagement


Benefits of Documentation of Instructor and Student Activities in the Classroom

- Provides data for self-review and peer-review of teaching
- Aids ability to track changes over time
- Helps instructors
  - Acquire a more accurate understanding of what’s happening in a class
    - Instructors often perceive that they are integrating more active learning than is documented by observers (Ebert-May, et al, 2011).
  - See a “big picture” view of a class session
  - Target specific strong points, as well as areas they would like to refine to better meet their teaching and learning objectives
Objectives for Creation of OPAL

- To encourage, and to document, innovation in teaching supported by AAU grant to improve STEM instruction

- To create a tool that presented documentary data on teaching in a useful, intuitive format for instructors in all disciplines, so that instructors could use the data to continually refine their teaching.
Models for Observing Teaching

- **Qualitative Review (feedback or evaluation)**
  - By colleagues in the department
  - By staff from centers for teaching and learning (experienced instructors)

- **Quantitative Protocols (training and evaluation)**
  - Reformed Teaching Observation Protocol (RTOP)

- **Quantitative Observation Protocols (documentation)**
  - Classroom Observation Protocol for Undergraduate STEM (COPUS)
  - Teaching Dimensions Observation Protocol (TDOP)
Why a timeline?

- Other protocols (e.g. COPUS) use pie charts/tables to show data

- Aimed to create visual depiction of the data
  - Comprehensive, chronological session

Observation Protocol for Active Learning (OPAL)

- Observation Protocol adapted from other models
- Non-evaluative documentation of instructor and student behaviors
- Flexible enough to use in various courses, disciplines, and to code varied definitions of active learning, lecturing, etc.

Method:
- Observer records what is happening in 2-minute segments
OPAL Codes

Instructor Codes
- Admin
- Lecture
- Questions/Answers
- Activities/Problem Solving
- Demonstrations
- Follow-up

Student Codes
- Listening
- Assessment
- Questions/Answers
- Activities/Problem Solving

Note-taking
- high, medium, low, zero

Attention
- high, medium, low

OPAL training takes 5-8 hours, spread across several days.
## OPAL Observations (Spring 2014 – Fall 2015)

<table>
<thead>
<tr>
<th>OPAL observations</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total observations (including pilot testing)</td>
<td>257</td>
</tr>
<tr>
<td>Courses</td>
<td>28</td>
</tr>
<tr>
<td>Instructors</td>
<td>39</td>
</tr>
<tr>
<td>Departments</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 75 students (large)</td>
<td>211</td>
<td>82.1%</td>
</tr>
<tr>
<td>&gt; 75 students (small)</td>
<td>46</td>
<td>17.9%</td>
</tr>
<tr>
<td>Lower-level</td>
<td>231</td>
<td>89.9%</td>
</tr>
<tr>
<td>Upper-level</td>
<td>26</td>
<td>10.1%</td>
</tr>
</tbody>
</table>

OPAL inter-rater reliability = .82
The next three slides featured unpublished data that has been removed from the online version of the slides.

Questions? Please contact Beth Fisher (bfisher@wustl.edu) or Erin Solomon (erin.solomon@wustl.edu)
Timeline Activity

Discuss in groups of three: ~5 minutes

- Review streamlined timeline, as if you are the instructor (who aims to increase interaction in class:
  - What do you observe?
  - Which aspects of the timeline are most useful and why? For example . . .
    - Interaction between instructor and students
    - “Chunking” of instructional methods and sequence of “chunks”
    - Student note-taking or attention
    - Numbers of questions and answers
  - What questions does the timeline raise for you, as the instructor?
“I can note the major aspects of a class (e.g., lecture, example problem, small group work, etc.), but it's almost impossible to be remember all the details of the interactions within each activity.

The OPAL data was a convenient way to see the breakdown of each in-class activity, note how and when my students responded to what I was doing, and to note what activities kept them most active and engaged.

It also helped me easily target segments of low engagement and think about how I could increase engagement and student activity during those times.”
“I had a qualitative feel for how I blocked out my class session time. These data helped to quantify that apportionment and [helped me to] face the reality that there was not as much two-way interaction as I had perceived.”

“It was helpful to see my class from the students' perspective. It brought to light things I didn't realize I was doing (both positively and negatively) that I was unaware of or that appear different from my perspective. Now I can consciously be sure to do the good things and think of ways to improve the less positive areas.”
“The OPAL was a great broad view of the class, and it could also be used to easily and visibly draw attention to parts of class that were very interactive or very lecture-based.”

“It's not feasible to discuss every minute of an hour long class, so the OPAL can help quickly and easily fill in those gaps.”

“Reviewing multiple OPAL timelines could either indicate trends and/or indicate if one class was an anomaly (and then lead you to look at why)”
References


Acknowledgements

Thank you:
• Faculty participants

Funding:
• Association of American Universities STEM Education Initiative
• Professional and Organizational Development Network in Higher Education

Additional Collaborators:
• Cheryl Cohen (CIRCLE)
• Gina Frey (Chemistry, The Teaching Center, CIRCLE)
• Dylan Jew (Computer Science and Engineering)
• Denise Leonard (The Teaching Center)
• Jia Luo (Chemistry)
• Jacinta Mutambuki (The Teaching Center)
• Santhi Pondugula (Medicine)