A report of active learning approaches in the large enrollment, upper division science lecture using trained peer facilitators.

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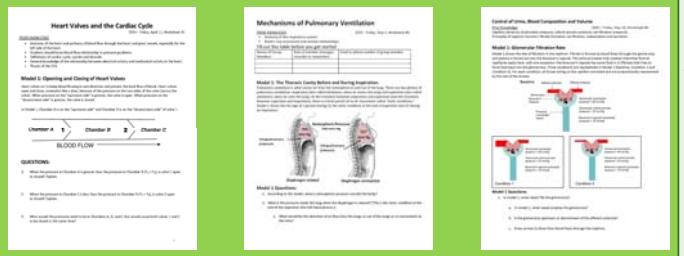
POGIL-FRIDAYS INTRODUCED SPRING 2014

- One lecture period of each week was used for a Process Oriented Guided Inquiry Learning (POGIL) worksheet session (Fridays of the 10 week term).
- Commercially available POGIL activities (Jensen et al., 2014) or similar activities created by other authors (Pat Brown) were modified.
- Some new POGIL-like activities were created by D. Quick.
- All worksheets were tested by instructor and LAs earlier in week, modifications made.

Assessment

- Formative assessments included feedback between LAs/students/instructor, in class clicker questions, post-activity on-line quizzes and written feedback to instructor.
- Summative assessment of content were multiple choice exams.
- Assessment of increased active learning component on student engagement was measured by class attendance and participation on regular twice weekly on-line quizzes.



Sample first pages of modified POGIL (left), modified POGIL-like (center) and newly created worksheets for use in facilitated classroom.

Background

Human Anatomy and Physiology sequence

- A content heavy, 3-term, upper division sequence course that is required for those interested in most health care related fields.
- Is a large lecture (500-700 students each term) in auditorium classroom with balcony.
- Class meets 3x 50-minute lectures per week at 8 am all year long (10 week terms).
- Student population is consistent throughout year, but diverse:
  - No prerequisites.
  - Students from four colleges and as many as ten majors.
  - Many are sophomores; some are juniors, seniors or post-bacc.
  - Most students also enroll in the coordinating cadaver based lab course; some do not.
  - ~90% of students have completed some college level chemistry, ~30% have completed some college level biology.
- Prior to Spring 2014, in class active learning strategies were facilitated solely by instructor and included:
  - Clickers
  - Think-pair-share
  - Free response to problem questions
  - Drawing, graphing, labeling
  - Predicting outcomes from data

LEARNING ASSISTANTS INTRODUCED SPRING 2014

- A Learning Assistant (LA) program was developed using the CU Boulder LA Program as a model.
- Learning Assistants (LAs) were former, successful students of Human A&P trained in a specially designed, seminar style, pedagogy course; course ran in Winter 2014 co-taught by D. Quick and D. Bennett.
- Pedagogy course topics: constructivist learning theory, cooperative and collaborative learning, scientific teaching, active learning, peer facilitation, metacognition and POGIL.
- For Spring term POGIL activities, the instructional team (course instructor and LAs) met to dry run the planned activity. The previous session was also debriefed and problems addressed.

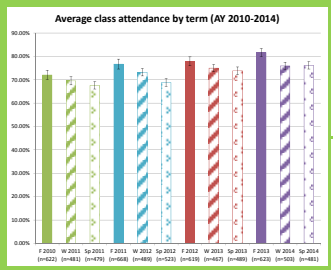
Assessment

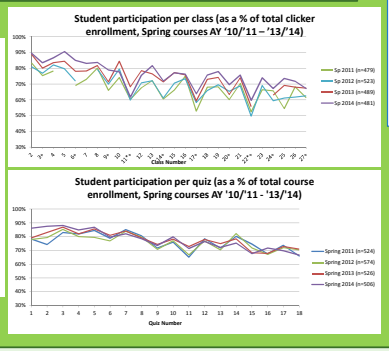
- Formative assessments of LAs in pedagogy course included daily study questions, reflections, group discussions.
- Forthcoming assessments of LA program include observation of facilitation, survey of LA attitudes towards group work, confidence in facilitation, classroom management, identity.

Seating map of the auditorium ground floor (left) and balcony (right). Colored circles represent seats available for students, rectangles/initials represent LAs. Note whole rows are left open to enable movement of LAs.

Measuring Student Engagement

- The ultimate goal of incorporating POGIL/POGIL-like activities and other active learning into our classroom is to increase student success and engagement of all learners (Freeman et al., 2014, Eddy & Hogan, 2014).
- Engagement in our course was measured by lecture attendance and student participation on twice weekly on-line quizzes.
- After implementation, average student attendance did not decline compared to Winter term, as had been observed in all previous years.





Classroom Implementation

- Classroom was divided into territories and seating left open for LA movement.
- 25 LAs occupied territories in class.
- Students given worksheet, self selected groups of 2-3 and self selected roles.

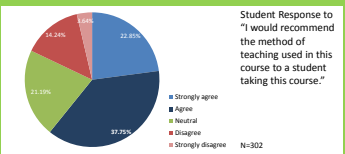
Typical Friday Session (50 minutes)				
2 min	15-25	5-10 min	10-15 min	2-5 min
Intro-duction	Students work through first models on worksheet (timer shown on projector) as LAs facilitate & give feedback	Clicker questions & group discussion	Continue to work through worksheet as LAs facilitate & give feedback	Clicker questions, "sticky issues," final thoughts

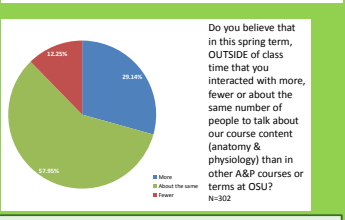
Students worked in groups of 2-3 to complete learning activity (POGIL/POGIL-like worksheet). LAs facilitate students and provide feedback. LAs can be seen standing or leaning in to observe/facilitate.

Regular Student Feedback to Instructor about Friday Sessions

- Free response, anonymous feedback from students was solicited 4 times during the term using LMS on-line system. Feedback was in response to this question: "Do you have any feedback for Devon about the worksheet - either the process, execution or content?"
- Demographic feedback was recorded for each Friday activity (number of questions finished, perceived time constraint & resultant stress, level of peer interaction).
- End of term feedback was also given in response to the two posed questions (at right).

Slide shown at first class to introduce LAs – each shown with favorite organ.





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University of Colorado, Boulder Learning Assistant Program: http://laprogram.colorado.edu/